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INTERNATIONAL ACETYLENE ASSOCIATION

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INTERNATIONAL ACETYLENE ASSOCIATION, CHICAGO, 1908.

ELEVENTH ANNUAL MEETING

OF THE

INTERNATIONAL ACETYLENE ASSOCIATION

HELD AT THE
AUDITORIUM HOTEL
CHICAGO, ILLINOIS
AUGUST 10, 11, 12, 1908

PRESIDENT	SECRETARY-TREASURER
M. J. CARNEY	A. CRESSY MORRISON

SECRETARY-TREASURER
1908-1909
A. CRESSY MORRISON
157 MICHIGAN AVE., CHICAGO, ILL.

BANQUET INTERNATIONAL ACETYLENE ASSOCIATION, CHICAGO ATHLETIC ASSOCIATION, AUGUST 12, 1908.

OFFICERS 1907-1908.

Acting President—M. J. Carney.

Secretary-Treasurer—A. Cressy Morrisson.

Directors—H. I. Gannett, J. B. Carroll, P. J. Kruesi, L. S. Bigelow, Samuel A. Menczer, Oscar F. Ostby.

OFFICERS ELECT 1908-1909.

President—M. J. Carney, Chicago, Ill.

Vice President—Oscar F. Ostby, New York.

Secretary-Treasurer—A. Cressy Morrison, Chicago, Ill.

Directors—H. I. Gannett, Omaha, Neb.; P. J. Kruesi, Chattanooga, Tenn.; L. S. Bigelow, New York City; J. B. Carroll, Chicago, Ill.; Samuel A. Menczer, Ft. Worth, Tex.; Jno. M. Brock, New York City.

COMMITTEES 1907-1908.

PRESS.

A. Cressy Morrison, E. A. Long, L. S. Bigelow.

INSURANCE.

A. Cressy Morrison, A. C. Collins, G. W. Mead.

TRANSPORTATION.

R. B. Steward, O. F. Ostby, P. A. Rose.

CARBIDS.

Augustine Davis, H. I. Gannett, P. J. Kruesi.

COMPLAINTS.

J. B. Carroll, Wm. Joyce, E. A. Long.

MEMBERSHIP.

A. C. Collins, H. I. Gannett, M. Kirchberger.

CREDENTIALS.

J. M. Brock, A. E. Schlieder, A. Cressy Morrison.

AUDITING.

J. B. Carroll, P. J. Kruesi.

RESOLUTIONS.

O. F. Ostby, B. O'Shea, E. C. Meissner.

RECEPTION.

G. W. Mead, Augustine Davis, L. S. Bigelow.

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REGISTER

Eleventh Annual Meeting International Acetylene Association

Chicago, Illinois 1907

C. Fred Brown, Chattanooga, Tenn.
Geo. E. Brittain, Dayton, Ohio.
John M. Brock, 1131 Broadway, New York City.
A. C. Collins, Elkhart, Ind.
W. A. Cox, Lafayette, Ind.
J. B. Carroll, 90 Illinois street, Chicago, Ill.
J. R. Crocker, Chicago, Ill.
W. W. Cozins, Hadley, Pa.
L. E. Coombs, 157 Michigan avenue, Chicago, Ill.
John D. Campbell, 157 Michigan avenue, Chicago, Ill.
M. J. Carney, 157 Michigan avenue, Chicago, Ill.
W. A. Cochrane, 104 Center street, New York City.
Augustine Davis, 90 West street, New York City.
C. L. Darnall, 120 West Eighth street, Chattanooga, Tenn.
C. W. Devoe, Auburn, N. Y.
W. H. Drake, San Jose, Cal.
John T. Earl, Elkhart, Ind.
Casper Fisher, Kirby, Ohio.
O. H. Fogg, 124 East Fifteenth street, New York City.
S. F. Fleece, Indianapolis, Ind.
A. P. Flynn, Logansport, Ind.
G. L. Gruner, St. Louis, Mo.

H. J. Grant, 1015 Flatiron building, New York City.
H. I. Gannett, 66 Exchange street, Buffalo, N. Y.
Henry Geissel, Wapakoneta, Ohio.
H. J. Hughes, Omaha, Neb.
Isaac W. Higgs, Chicago, Ill.
A. E. Hamilton, Plymouth, Ill.
Ralph H. Healan, 157 Michigan avenue, Chicago, Ill.
John F. Hanna, Monmouth, Ill.
Murray Howe, 157 Michigan avenue, Chicago, Ill.
I. N. Johnson, Crawfordsville, Ind.
J. A. Johnson, Crawfordsville, Ind.
M. Kirchberger, 339 Broadway, New York City.
Paul J. Kruesi, Chattanooga, Tenn.
Elias A. Long, 324 Dearborn street, Chicago, Ill.
S. A. Menczer, 713 Front street East, Ft. Worth, Tex.
E. C. Meissner, 1528 Pine street, St. Louis, Mo.
A. Cressy Morrison, 157 Michigan avenue, Chicago, Ill.
Albert T. Mertes, Notre Dame, Ind.
A. D. Meeker, Marshalltown, Ia.
F. B. Mueller, Decatur, Ill.
J. M. Morehead, 157 Michigan avenue, Chicago, Ill.
A. R. Nordvall, Stockholm, Sweden.
B. O'Shea, 157 Michigan avenue, Chicago, Ill.
Oscar F. Ostby, 80 Broadway, New York City.
Geo. F. Owen, Grand Rapids, Mich.
G. G. Pond, State College, Pa.
G. P. Rose, 157 Michigan avenue, Chicago, Ill.
C. E. Riley, Dayton, Ohio.
P. A. Rose, 157 Michigan avenue, Chicago, Ill.
W. J. Stinson, Minneapolis, Minn.
F. E. Sadler, 556 E. Sixty-fifth street, Chicago, Ill.
F. E. Stover, Luray, Va.
J. V. Simeral, 157 Michigan avenue, Chicago, Ill.
Lakins W. Smith, 111 E. Fifth street, Topeka, Kans.
Charles F. Timm, 1131 Broadway, New York City.
R. G. Tomlinson, Chillicothe, Ohio.
O. M. Thompson, 157 Michigan avenue, Chicago, Ill.
Charles E. Ummach, 88 Washington street, Chicago, Ill.

Geo. Landis Wilson, 239 Lake street, Chicago, Ill.
V. H. Webb, Monmouth, Ill.
E. E. White, 157 Michigan avenue, Chicago, Ill.
C. D. Wallace, Olmsted Falls, Ohio.
M. T. Whitney, Decatur, Ill.
F. H. Wacksmith, Chicago, Ill.

LADIES REGISTERED.

Mrs. Casper Fisher, Kirby, Ohio.
Miss Helena M. Long, Chicago, Ill.
Mrs. A. R. Nordvall, Stockholm, Sweden.
Mrs. E. E. White, Chicago, Ill.
Mrs. A. C. Morrison, Chicago, Ill.
Mrs. G. L. Wilson, Chicago, Ill.
Mrs. Cox, Lafayette, Ind.
Mrs. F. E. Sadler, Chicago, Ill.
Mrs. Charles E. Ummach, Chicago, Ill.
Mrs. O. M. Thompson, Chicago, Ill.
Miss Higgs, Chicago, Ill.

CONVENTION INTERNATIONAL ACETYLENE ASSOCIATION.

Auditorium Hotel, Chicago, August 10, 1908.

Morning Session.

President: M. J. Carney, in the Chair.
Secretary: A. Cressy Morrison.
Meeting called to order at 10:45 a. m.

The Chairman: Gentlemen, it gives me great pleasure to welcome you to the eleventh annual meeting of the International Acetylene Association. It is gratifying, indeed, to see so many of the old guard present, as well as the large number of new members. In the name of the association I extend to you a very cordial greeting, and on behalf of the resident members, I give you a most hearty welcome and hope your visit here will be both pleasant and profitable.

Mr. Kirchberger: Mr. Chairman, on behalf of the members present, I beg to thank you for your welcome, and desire to say that the meeting in Chicago starts in with double the number present we had last year. It is a question whether Chicago did it or not, but whatever it is we are all glad to be here with you and join you in your wish to make the meeting successful.

ADDRESS OF PRESIDENT CARNEY.

Gentlemen: The work of the committees and the admirable papers which have been prepared for this meeting leaves little for the president today in detail, but the strong features of these reports deserve to be particularly emphasized. It is the duty of the office which I have the honor to hold to point out the progress of the industry and to accentuate those features which are such a glorious compliment to those engaged in the industry.

The progress has been so steady from the very inception of our mutual enterprise that one cannot speak of the present without referring with almost affectionate appreciation to those who, year by year, have in the work of the association laid those foundations upon which we are now building the superstructure. The present progress of the industry and its firm position is a most complete evidence of how well they performed their work. So, in speaking to you this morning of a year of rapid and marked advancement in the industry, I wish to acknowledge the debt we all owe to our predecessors in the past, a debt which is the underlying force that gives to the present its great momentum.

There are two tendencies at work which are rapidly eliminating from the public mind any apprehension which may have hitherto existed regarding the safety of acetylene. First, is its much larger use. The word "acetylene" is very much better understood by people generally. One of the influences which is bringing this about, especially in the city, is the use of acetylene on automobiles and upon railroads. Hundreds of thousands of automobile users, all those who observe the use of acetylene in headlights and those who sit beneath its beneficent rays on the railroad trains are coming to realize that this illuminent has a place in the world, that it is no longer a novelty and as, in spite of the enormous increase in the use of acetylene, accidents are very infrequent, the public has come to regard acetylene as a common illuminant. The introduction of acetylene into the country is now so widespread that there is scarcely a community in which some home is not successfully and satisfactorily lighted, and, above all, safely lighted by acetylene. In other words, the illuminant, by its sheer merit, coupled with the industry of the members of this association, is rapidly taking the place which it deserves in the public estimation, and the public as a whole now regards an accident from acetylene as it would regard an accident from any other means of illumination, and is coming to understand that accidents of this character are less frequent than where other illuminants are used. The other factor in modifying public opinion on this subject is the immense amount of attention which is being paid to acetylene in the public prints. The advertising efforts which have been put forth so persistently and so clearly by the members of this association are bearing fruit, not only in familiarizing enormous numbers of people with the subject and the oft reiterated statements as to the merit of the illuminant and its safety, but there has been, during the past few years, a tremendous lot said in regard to acetylene. especially in the scientific and technical journals, which is an outgrowth of the persistent and tireless efforts of this association to get before the public not only scientific articles, but popular articles which will be reread and reprinted for the benefit of the great masses of people. The report of the press committee will show that, during the past year, even more has been done than in any previous year, and that the International Acetylene Association is well recognized by the scientific and technical press as a source of accurate and authoritative information and news regarding acetylene. The position thus taken by the association in this field dignifies the body and gives its literature weight and character, not only on this hemisphere, but it is gratifying and complimentary to our association to know that the foreign journals are paying constant and thorough attention to everything that we do here,

A great step forward has been taken this year in the relations betewen the insurance interests and the acetylene industry. The report of the committee on insurance last year merely reported progress in the great work of bringing about a modification of the insurance rules which would free the acetylene industry in this country from many hindering and restricting conditions which militated against our interests in all directions. It is gratifying indeed for me to state that the efforts of the committee on insurance have been phenomenally successful. The pathway marked out by that committee last year has been followed to its logical termination and acetylene stands today with the insurance companies as safer than the illuminants which it replaces. The rules have, therefore been completely reversed. Acetylene, instead of being condemned, is now being encouraged; inside installation which was prohibted is now permitted; restrictions regarding fireproof construction, which were impossible of execution if the industry was to live, have been removed. Calcium carbide is now recognized as a perfectly safe commodity to handle. Liberal rules regarding its storage have been promulgated. The insurance interests recognize that the acetylene industry is one of the few industries which have adhered loyally to the principle that the rules of the insurance companies, if followed logically, will lead to a better condition in the industry, and the resulting co-operation has brought the two interests so close together that it is believed there will be no possibility of further misunderstanding. In the question of insurance, as we sow, so shall we reap. Careful and persistent following out of the now fair requirements of the insurance boards will retain for us always the friendship and good will of those boards, and will continue us in the position which we now hold of deserving well at their hands.

There is still great work for the incoming committee on insurance to do. Some local associations are now in process of modifying their rules in accordance with the changes brought about by the central body, and some will be induced to take up the matter very shortly. It is hoped and believed that these changes will be brought about in the very near future, and at the next annual meeting the complete modification of the insurance question will be brought about most satisfactorily.

While the past year has been one of financial difficulties it is gratifying to be able to say that the acetylene industry has gone forward with leaps and bounds. This is due to several causes which are now operating more and more satisfactorily and which are designed to accelerate the progress of the industry constantly. The factors which I have mentioned—the greater use of acetylene, the better understanding of its nature, not only by the people of technical knowledge, but by the public at large, and the radical change in the insurance situation which makes it possible for us to say that we are regarded by those most interested as the safest of modern illuminants, have had their effect. They not only have had their effect upon the consumer who fears less, questions less and desires more, but upon the salesman and dealer who feels a greater momentum behind him, a greater confidence in acetylene, and whose enthusiasm is constantly stimulated by the undoubted fact which he can now see, as we have seen in the past, that the industry is upon a permanent and substantial basis, and that its progress will therefore become increasingly rapid. It seems as though the realization of the substantial character of the industry is calling to its service every possible talent which has hitherto been latent in the membership of this association, and inventive genius in all directions is attracted by our sturdy advance in the field of illumination. Inventive genius is applying itself to the solution of many problems of acetylene in new and unexpected fields. The past year has seen a rapid increase in the utilization of small units of acetylene in many unexpected directions. We have witnessed, during the past year, the commercial beginning of a method of utilization which, in its wide application to the metal industry, promises to create a revolution. Many of the fields of promise which were pointed out in a prophetic paper last year have been entered upon profitably, and I recommend to the members of this association that, having the subject in their grasp, they give due and studious attention to the possibilities of acetylene in these new fields, some of which may even be wide open.

One of the great influences for the rapid advancement of the industry is the fact that it contains within itself great opportunities for energetic men. The fact that the industry is now acknowledged a safe, stable and permanent industry and that its progress is to be greater and greater is attracting a very much higher class of men, salesmen of a higher order, dealers of greater ability. Both salesmen and dealers are now enabled to earn, not only a satisfactory income,, but it is no exaggeration to say that a salesman can earn more selling acetylene generators today than he can by selling any other specialty or staple. It is possible to show competent men that should they ally themselves with this industry at the present stage of its growth, they will advance with it rapidly, and that the future will hold something in store for them. In no stage in the history of acetylene has this been so true as it is today. We know as individual members that we are able to get a better class of men. We further know that we can pay for this class of men and that it is better to get good men than mediocre men. The ease with which acetylene generators can be sold today in comparison, by a single salesman, with the past is gradually reducing the selling cost per generator, and is largely increasing the number sold. Local dealers throughout the country are finding that acetylene is sufficiently well known in the communities which they work, so that its merits are understood, less argument is necessary, the illuminant is more staple and the householder is becoming much more ready to buy.

Underneath all this is the crying demand for better illumination. For this we are largely indebted to the floods of light which have come from the mantle burner and the improvements in electricity. The eye hungers for more light. The demand for more light is now reaching the rural districts with such force that its benefits are becoming so well understood that, whereas in the past it was sometimes necessary to almost force acetylene upon a community, now the community is of itself considering the problem of better illumination. The evolution of acetylene has now reached the stage where its greatness is attracting attention and the cry for better men is being promptly answered by strong workers who are adding their momentum to our mutual progress.

The industry has been actively canvassed for new members and it is gratifying to be able to state that thirty-one new members have been added to the association during the past year. Hitherto it has been customary to be lenient with the membership, and as a result some of the members fell into arrears for dues, in a few cases running back four and five years. A new policy has been inaugurated. The members who have been delinquent have been given every opportunity to bring their membership up-to-date, and where no disposition has been shown to do this they have been eliminated and are not now called members. The loss, however, has been slightly overbalanced by the gain, a gain to the association of being able to say for a certainty that every member now called a member is really a member, with dues full paid, and a satisfactory thing from every standpoint.

There is in the industry today another factor which means a tremendous force in the advancement of acetylene, and that is the growing harmony of relations and better understanding which exists largely as a result of the fraternity and good feeling which is the outgrowth of the meetings of this association. The association is worth while. There is no influence in the industry which is today producing a greater good than the friendships and better understandings which are the outgrowth of our meeting together once a year upon the absolutely mutual ground which membership in this association assures us. This organization is not a partisan body; it has no bias or prejudices; it has but one constant idea before it, and that is the good of the industry. Every individual member of this association has come to feel that all the influence of the association will be exerted to protect and advance his interests the moment his interests cease to be personal and become a factor in the progress of the industry.

Let us then, gentlemen, go forward with courage in the present and with high hopes for the future which, great as it may seem to us now, will surely dwarf our present expectations in a splendid realization.

Mr. Gannett: Mr. President, I would like to ask permission to make a motion to Mr. Morrison. I move that by unanimous acclamation Mr. Carney be made actual President instead of acting President.

Mr. Collins: I second that motion.

The Secretary: It has been regularly moved and seconded that the association make Mr. Carney actual President, and that by acclamation.

(The motion was unanimously carried.)

The President: Gentlemen, it is needless for me to say that I am overwhelmed. I thought that when I had reached the office of Vice-president I was getting along, and when, through the resignation of Mr. Einstein, I was made Acting President, I thought I had reached the very highest pinnacle of my acetylene career; but now that I have been made a real President, I feel the compliment very deeply.

We are now ready for the report of the Secretary.

REPORT OF THE SECRETARY.

A. Cressy Morrison.

Your Secretary takes pleasure in reporting that the past year has been one of progress in every direction. The association has advanced materially, not only in the opinion of the public, but, what is even more gratifying from the standpoint of the Secretary, in the estimation of the members themselves. There is better cohesion and better fraternity, the members are more enthusiastic, and they certainly do co-operate with the Secretary in everything that pertains to his duties.

The correspondence during the year has been voluminous. It has been necessary to prepare a good many articles for the public press. The Secretary has received a great many inquiries from the members which required considerable research that they might be authoritatively answered, and on behalf of the association, the Secretary has been called upon to perform a good many duties which seem to be an outgrowth of the rapid development of the interests of the association in all directions.

The duties of office, however, have been a distinct pleasure to your Secretary, and he rejoices in the fact that he had an opportunity during the past year to show his appreciation of the high honor which his election last year conferred upon him.

The Chairman: Gentlemen, you have heard the Secretary's report. What is your pleasure? Motion is in order.

(Motion duly made and seconded that report be accepted as read.)

The Chairman: It is regularly moved and seconded that the Secretary's report be accepted as read. Are there any questions? All in favor of the motion as given, signifying by saying aye.

(Motion was carried.)

The Chairman: We are now ready for the Treasurer's report.

REPORT OF THE TREASURER.

A. Cressy Morrison.

Attached hereto is the financial report accompanied by the books of the association, which await the action of the auditing committee.

The gross receipts from membership and other sources have been supplemented by a contribution to the association from the Union Carbide Company of $500.00. In this connection, the Treasurer desires to say that the present successful meeting and the delightful entertainments which are in store for us would have been entirely impossible without this generous assistance.

It is gratifying for your Treasurer to be able to state that the membership sends in its dues now promptly and usually with hearty good words, which indicates that the association work is meeting with the approval of the membership.

We need more members, and the Treasurer looks forward to the coming year as one promising greater prosperity than the association has ever known in the past.

Mr. Morrison: I would like to say in this connection that the books are not attached to this paper. They are being made up at present, and will be available to the auditing committee as soon as it is ready. The advent of some new members this morning also changes the figures.

I would like to say that when the Auditing Committee renders its report it will give you the actual amount of receipts and disbursements for the year.

The Chairman: Gentlemen, you have heard the Treasurer's report. What do you wish to do with it?

(Moved and seconded that report be accepted as read.)

The Chairman: It is regularly moved and seconded that the Treasurer's report be accepted as read. All in favor signify by saying aye. Contrary no.

(Motion was carried.)

The Chairman: The Auditing Committee should take charge of the Treasurer's books as soon as possible. The books will be here in the afternoon and turned over to them at that time.

Mr. Collins: Can the Membership Committee make a partial report here? We have some money that ought to go on these books.

The Chairman: I was just going to call on the Membership Committee.

Mr. Collins: I have the names here of N. J. Ostby and D. E. Lawson for associate membership, accompanied by the regular fee. I would like to propose their names for membership.

(Motion was made for the suspension of the rules and the unanimous election of both members.) Carried.

REPORT OF THE MEMBERSHIP COMMITTEE.

A. C. COLLINS, Chairman.

Your committee on membership desires to report that this year has been one of very considerable activity. The total number of members reported was ninety-five. We found, however, that many of these members were largely in arrears for dues, and a system of elimination has been inaugurated. Every opportunity has been given these delinquents to renew their activity, and in many cases the committee congratulates itself, it has succeeded in bringing them up-to-date. Where no disposition has been shown to pay up, the name has been abandoned. By this process of elimination, thirty-three members have been taken off the list. While this process of elimination has been going on, the committee has devoted its energies to adding to the membership as many names as possible. In this the committee has had some assistance from the membership at large. We take pleasure in reporting that thirty-one names have been added up to the time of writing this report. The membership today all full paid is ninety-three.

The committee respectfully recommends that the incoming Committee on Membership make the most thorough canvass during the next year, as there is a large number of people who should join the association. It is the opinion of the Membership Committee that the dues are so very low, considering the important work of the association, that there is no one in the industry, manufacturer, salesman or dealer, who should not be a member of the association.

Attached hereto is given a list of the membership as it is today:

ACTIVE MEMBERS INTERNATIONAL ACETYLENE ASSOCIATION.

The Acetylene Lamp Co., 50 University Place, New York City.

P. C. Avery, c/o Avery Portable Lighting Co., Milwaukee, Wis.

E. C. Benedict, 80 Broadway, New York City.

L. S. Bigelow, 265 Broadway, New York City.

Eugene Bournonville, 90 West St., New York City.

E. D. Bullard, 268 Market St., San Francisco, Cal.

Geo. E. Brittain, Dayton, Ohio.

J. M. Brock, c/o Wm. M. Crane Co., 1131 Broadway, New York City.

M. J. Carney, c/o Acetylene Apparatus Mfg. Co., 157 Michigan Ave., Chicago, Ill.

J. B. Carroll, 90 Illinois St., Chicago, Ill.

S. K. Challman, 4737 Calumet Ave., Chicago, Ill.

J. T. Cochrane, The Plains, Va.

W. A. Cachrane, 104 Center St., New York City.

John H. Coke, 152 22d Av., Seattle, Wash.

A. C. Collins, c/o Davis Acetylene Co., Elkhart, Ind.

C. L. Darnall, 120 West 8th St., Chattanooga, Tenn.

Augustine Davis, 90 West St., New York City.

Augustine Davis, Jr., Elkhart, Ind.

John T. Earl, c/o Davis Acetylene Co., Elkhart, Ind.

C. J. Elderfield, c/o Niagara Falls Acetylene Gas Generator Co., Niagara Falls, N. Y.

Electro Lamp Co., 2 Rector St., New York City.

Louis F. Franz, 114-116 N. St. Clair St., Dayton, Ohio.

H. I. Gannett, 66 Exchange St., Buffalo, N. Y.

John F. Hanna, Monmouth, Ill.

The J. Harris Co., 49 Wood St., Cleveland, Ohio.

J. T. Hays & Son, Emmitsburg, Md.

R. H. Healan, c/o Acetylene Apparatus Mfg. Co., 157 Michigan Ave., Chicago, Ill.

Isaac W. Higgs, Chicago, Ill.

John S. Howell, Auditorium Bldg., Chicago, Ill.

H. J. Hughes, c/o Monarch Acetylene Gas Co., Omaha, Neb.

J. A. Johnson, Crawfordsville, Ind.

Wm. Joyce, c/o Davis Acetylene Co., 90 West St., New York City.

C. A. King, Norwich, N. Y.

Moritz Kirchberger, 339 Broadway, New York City.

Paul J. Kruesi, c/o American Lava Co., Chattanooga, Tenn.

W. A. Cochrane, 104 Center St., New York City.

E. A. Long, 324 Dearborn St., Chicago, Ill.

W. P. Martin, 157 Michigan Ave., Chicago, Ill.

Giles W. Mead, c/o Union Carbide Co., 79 Wall St., New York City.

A. D. Meeker, 503 S. Center St., Marshalltown, Iowa.

Sam'l A. Menczer, 713 Front St., East, Ft. Worth, Texas.

Thos. T. W. Miner, 821 Eagle Ave., New York City.

F. B. Mueller, Decatur, Ill.

A. Cressy Morrison, c/o Union Carbide Co., 157 Michiagn Ave., Chicago, Ill.

Benjamin O'Shea, c/o Union Carbide Co., 157 Michigan Ave., Chicago, Ill.

Oscar F. Ostby, c/o Commercial Acetylene Co., 80 Broadway, New York City.

George F. Owen, Grand Rapids, Mich.

A. B. Proal, 2 Rector St., New York City.

P. A. Rose, c/o Acetylene Apparatus Mfg. Co., 157 Michigan Ave., Chicago, Ill.

J. K. Rush, Canandaigua, N. Y.

A. E. Schlieder, c/o Monarch Acetylene Gas Co., Buffalo, N. Y.

N. D. Shaffer, c/o Ideal Epworth Acetylene Co., Johnstown, Pa.

John Seymour, c/o Frontier Gas Meter & Appliance Co., 1443 Niagara St., Buffalo, N. Y.

C. S. Steward, c/o D. M. Steward Mfg. Co., Chattanooga, Tenn.

D. M. Steward Mfg. Co., 47 Murray St., New York City.

W. J. Stinson, c/o Acetylene Contracting Co., Minneapolis, Minn.

Kuno Thurnauer, c/o J. von Schwarz & Jean Stadelmann Co., Nuremberg, Germany.

Chas. F. Timm, c/o Wm. M. Crane Co., 1131 Broadway, New York City.

Victoria Mfg. Co., Auburn, Me.

V. H. Webb, c/o Monmouth Acetylene-Electric Mfg. Co., Monmouth, Ill.

Geo. H. Werner, c/o Wm. M. Crane Co., 1131 Broadway, New York City.

R. H. Welles, 180 Deming St., Kenosha, Wis.

R. Williamson & Co., 88 Washington St., Chicago, Ill.

Geo. Landis Wilson, 239 Lake St., Chicago, Ill.

Wm. H. Wardwell, c/o Shawinigan Carbide Co., Montreal, Canada.

ASSOCIATE MEMBERS.

H. R. Anderson, Albion, N. Y.

George Breck, 550-554 Grove St., San Francisco, Cal.

Geo. F. Clamer, Collegeville, Pa.

Seward Davis, 29 Liberty St., New York City.

C. W. DeVoe, Auburn, N. Y.

Edward J. Dolan, 3267 Chancellor St., Philadelphia, Pennsylvania.

J. W. Erickson, 710 Avenue C, Miami, Fla.

Geo. C. Ficklen, Somerset, Va.

Casper Fisher, Kirby, Ohio.

O. H. Fogg, 124 E. 15th St., New York City.

John M. Goeke, c/o Krein Mfg. Co., Wapakoneta, Ohio.

J. H. Haarn, Beeville, Texas.

B. Hammar, c/o Hammar & Co., Konigstrasse 11/13, Hamburg, Germany.

Thos. H. Harris, Pox 650, Havana, Cuba.

James M. Heatherton, 45 West 34th St., New York City.

Wm. E. King, Fall River, Mass.

Geo. F. Klemm, 132 N. 5th St., Philadelphia, Pa.

D. E. Lawson, Chattanooga, Tenn.

E. J. Marshall, 227 Fulton St., New York City.
A. R. Nordvall, Stockholm, Sweden.
Norman J. Ostby, 80 Broadway, New York City.
C. E. Riley, Conover Bldg., Dayton, Ohio.
F. E. Sadler, 556 East 65th St., Chicago, Ill.
F. J. Shelton, c/o The Heat, Light & Supply Co., 108 Lambton Quay, Wellington, New Zealand.
C. D. Wallace, Olmsted Falls, Ohio.
A. J. D. Wedemeyer, Liberty, N. Y.
E. Whitney, c/o E. P. Gleason Mfg. Co., 37 Murray St., New York City.
F. G. Whittier, c/o Eagle Generator Co., St. Louis, Missouri.

The Chairman: You have heard the report of the Membership Committee. What do you wish to do with it?

(Moved and seconded that it be accepted and placed on file.) Carried.

The Chairman: Now, gentlemen, I believe we are ready for the Insurance Committee's report, one that I am sure you will be very greatly interested in.

REPORT OF THE COMMITTEE ON INSURANCE.

A. Cressy Morrison, Chairman.

The committee on insurance at the annual meeting last year was only able to report that a great deal of persistent effort was being put forth with the insurance companies to bring about a modification of certain arbitrary rules which had been enforced from the inception of the industry. The hope was expressed at that time that, at this meeting, your committee would be able to report that it had met with success.

It is with a great deal of pleasure that your committee desires to say that its greatest hopes have been realized. On January 30, the Executive Committee of the National Board of Fire Underwriters, which is the final body, adopted the recommendation of the Board of

Engineers and modified its rules, permitting inside installation of permitted acetylene generators. On January 30, the old rule, requiring fire-proof construction of outside generator houses in closely built-up districts, was abandoned. On April 30, the Executive Committee modified the rule regarding the storage of calcium carbide, which required that calcium carbide could not be kept on insured premises in larger than two pound cans and in a metal receptacle, so that six hundred pounds in one hundred pound drums can now be kept on insured premises without violating the insurance regulations. On June 25, the Executive Committee of the National Board adopted the formal permits, modified in accordance with the rules given above, thereby ratifying all the acts in relation to acetylene which had gone before.

These changes in the rules and regulations were not brought about without effort. Your committee was obliged to present its arguments before every important insurance official of the National Board of Fire Underwriters individually, to appear at the fixed and stated meetings of the various Boards and Committees which constitute the governing power of the insurance officials, and was obliged to meet in detail all the arguments, prejudices and preconceived notions which could be formulated or which existed in this very conservative body.

A factor which militated against success was the tremendous losses which insurance companies had sustained in the series of great fires, ending with the San Francisco disaster. The watchword of insurance companies was retrenchment and the reaccumulation of the depleted surplus. It was only by demonstrating the fact unquestionably that acetylene illumination was safer than the illuminants which it replaces, and this when the generator is installed in insured premises, that any progress could be made. When this was demonstrated and those in authority were convinced that it was true, then it became the interest of the Insurance Board to encourage acetylene, and the rules were modified in accordance with this idea.

The tremendous advantage to the members of the association of this change lies not only in the fact of the liberalization and in settling vexed questions regarding insurance locally, but the stupendous compliment which has been paid the association by the insurance fraternity in acknowledging that it is the safest of illuminants, when installed in accordance with the rules and regulations of the National Board, takes out of the mouths of our competitors any further argument as to acetylene being dangerous. We are a free industry, and so long as we adhere to the present reasonable rules of the National Board of Fire Underwriters, we are in the ideal position of being the only illuminant which has been declared safer than the illuminants it replaces, by that so august and important body.

Appended hereto are the modified rules.

STORAGE OF CALCIUM CARBIDE, OLD AND NEW RULES.

OLD RULE.

14. — Calcium Carbide in quantities not to exceed 600 pounds MUST BE STORED in approved packages, holding not to exceed 100 pounds each, OUTSIDE OF INSURED PROPERTY, in a locked receptacle or enclosure constructed according to the following specifications:

a. A waterproof structure or receptacle having the bottom raised at least twelve inches above the ground and LOCATED AT LEAST TEN FEET FROM ANY BUILDING.

1908 RULE.

14. a. Calcium Carbide in quantities not to exceed six hundred pounds (600) MAY BE STORED, when contained in approved metal packages not to exceed one hundred pounds (100) each, INSIDE INSURED PROPERTY, provided that the place of storage be dry, waterproof and well ventilated.

INSTALLATION OF GENERATORS.

OLD RULE.	1908 RULE.
To secure the LARGEST MEASURE OF SAFETY to life and property, the following rules for the installation of acetylene machines must be observed: a. Generators MUST BE PLACED IN A SEPARATE AND INDEPENDENT BUILDING, constructed and located as specified in Rule 9.	To secure the LARGEST MEASURE OF SAFETY to life and property, the following rules for the installation of acetylene machines must be observed: a. Generators, especially IN CLOSELY BUILT UP DISTRICTS SHOULD PREFERABLY BE PLACED OUTSIDE of insured buildings in compliance with Rule 9.

OUTSIDE GENERATOR HOUSES.

OLD RULE.	1908 RULE.
a. In closely built up districts generator houses MUST BE OF BRICK, FIREPROOF and located as far as practicable from other buildings. They must not open into or toward adjacent building.	(No mention of materials.) a. Outside generator houses should not be located within five (5) feet of any opening into, nor shall they open toward any adjacent building.

Mr. Morrison: I will not burden the meeting with the reading of these rules, except to state in addition that, whereas outside installation was required, inside installation is now permitted; where a complicated set of rules was used to govern the storage of calcium carbide, now calcium carbide can be stored with practically no restriction, and the permit which has been granted clinches the whole matter and makes us safe so long as we behave ourselves.

Mr. Davis: I would like to say for the information of the members of the association who do not know that to Mr. Morrison, working with the Union Carbide Company, and I think to him more than to any other cause, has been due the success which has been met in this insurance matter. I know that he has done a very great and effective work and I think he should have some credit for it.

The Chairman: Gentlemen, you have heard the report of the Insurance Committee. What do you wish to do with it?

Mr. Kruesi: I move that it be accepted and filed.

(Motion carried.)

The Chairman: I believe that the Chairman of the Committee on Complaints is present. Mr. Carroll, we would like to hear from you.

Mr. Carroll: No complaint.

The Chairman: You have heard the report of the Committee on Complaints. What do you wish to do with it?

Mr. Kirchberger: I move that it be accepted.

(Motion seconded and duly carried.)

The Chairman: We have with us this morning, gentlemen, one to whom you need no introduction, who has not been with us for the past few years for very good reasons, and that is our former three times President, Mr. Wilson. We would like to hear from Mr. Wilson.

Mr. Wilson: While perhaps I had something to do with the inauguration of this enterprise, I must acknowledge my indebtedness and the indebtedness of this association to Mr. Carroll, who really had the initiative to get us together. For a good many years the International Acetylene Association was a joke. It was a good deal of fun. There were a number of us who realized, however, several things. First and foremost, we recognized the fact that until we could secure the attention, and the serious attention of the insurance people, we could hope for little in this industry.

Starting out with Mr. Davis, or rather it was before Mr. Davis came over the horizon,—a little later about 1895, that we built some generators. We kept on building generators, and when the first question came up about the installation of these generators, it was not a question of the kind of generator to be installed, but it was a question of whether they would be allowed at all, and so on. At that time we did not have the privilege of going before the Underwriters Laboratory and having the thing thrashed out all at once, but we had the privilege of going before the Chicago Underwriters' Association, putting up a hundred dollars and convincing a committee of men who didn't know anything about it, that it was all right. That gave us the permission to install generators in Cook County, Illinois, and not anywhere else. After that it was better; we managed to sell more generators away from here. I was on a trip in the East and had a telegram to go to Boston. I went up to Boston, paid another hundred dollars and tried to satisfy the people that it was all right. After that we had the same glorious opportunity to do the same thing in Philadelphia, Providence, Cleveland, Cincinnati, and so on. Then, after we had done all that, we began to recognize the fact that this did not give us the right to bring our trouble up with the Southeastern Tariff Association, the Central Department of the State Association, and all the rest of them, but first we had to furnish them with one hundred and fifty or two hundred dollars, and they would not test a generator unless we were there on the spot. That was the situation when we went up against this game.

We believed that it never would be modified until the time came when the industry could put up a pretty fair showing. Mind you, each one of these associations had its own set of rules and regulations. In some sections, you could put the generator outside in a fire-proof house; in another place, you could put your generator down cellar and put it up any way you wanted to, and it was all right; just as the individual wanted to have it. It was a decidedly unsatisfactory business, particularly when you were handling something that approached a national advertising campaign.

In addition to that, the public generally did not know anything about it; they thought they knew a lot. Acetylene meant danger to them, it meant hazard, expense and labor. In the face of that, however, the industry grew.

A lot of people in the industry did not come into the association. Our friends down here on Michigan Avenue, the Union Carbide Company, got it into their heads that we were a sort of union, intending to make trouble for them. It took a good many years to get the Union Carbide Company to the point where they realized it was a fair game, and finally when they realized that, they began to line up. So, one by one, we managed to get the industry together, and we now have a truly national organization which is beginning to show results.

The education of the public was, to our minds, the most important work of the association. The publications generally seemed to be very, very slow about taking the matter up. They did not seem to regard it as good news matter, and it usually was impossible to get much of it printed. Still it was printed and some reprinted, and by and by some of the magazines began to ask for it, and then we began really to get general publicity for acetylene as an industry.

Now, so much for the past. I am not so old yet that I live in the past; not by a majority. Still it is just as well to think of some of our past troubles in order to realize our present blessings. There are some more things that can be duly attempted in the acetylene industry, and during the next few days, I hope to have an opportunity to come before you and make a few suggestions.

The Chairman: Gentlemen, we have a paper here by Mr. Cecil Lightfoot, which I will ask our Secretary to be good enough to read as Mr. Lightfoot is not here.

Mr. Morrison: I received a telegram this morning from Mr. Lightfoot, expressing his great regret that he should not be able to be present, as he had hoped to be present. He has, however, sent this paper on "The Influence of Oxygen in Extending the Use of the Oxy-Acetylene Blowpipe."

To those who are not familiar with the existence of the oxy-acetylene blowpipe, it will perhaps be interesting to state that the production of oxygen economically is perhaps the key to its greater use. There have been a good many who have been working on this problem, and Mr. Lightfoot has done something towards a solution of it. His paper deals with that something.

THE INFLUENCE OF OXYGEN IN EXTENDING THE USE OF THE OXY-ACETYLENE BLOW-PIPE.

By Cecil Lightfoot, Consulting Engineer.

The application in the United States of the Oxy-Acetylene Blowpipe to the welding of metals has not been developed at present to anything like the same extent that it has in England and on the Continent of Europe. This is no doubt because until within a comparatively few months there existed no satisfactory source of supply of the necessary oxygen. To some extent the absence until quite recently of any by-laws regulating the traffic in compressed oxygen and its transportation by rail, with the difficulty in cases of getting the traffic accepted at all, no doubt discouraged any serious effort to develop the trade.

Oygen could certainly be obtained in most cities in the country, but its price was prohibitive for industrial application, while in most cases its purity was as equally problematical as nebulous. At that time the general practice in this country was to compress the gas to a pressure of about 250 pounds per square inch into riveted and brazed cylinders of steel or wrought iron, of diameter relatively large compared with the length. It is, however, essential that for economical results to be obtained on an industrial basis, the gas should be compressed to a higher pressure, as is now universally and without exception adopted in Europe, the construction of the cylinders being modified accordingly.

When in 1897 Dr. Carl von Linde succeeded in separating the constituents of the atmosphere by means of his method of air liquefaction and subsequent rectification, the solution of the problem of how to produce pure oxygen in large quantities and at a low price was realized. Now that the railroad companies have at length officially recognized the traffic in cylinders of oxygen under high pressure by the adoption of suitable regulations for its control, and with the establishment on an extensive scale of an oxygen plant by the Linde Air Products Company at Buffalo with an output of many thousands of cubic feet a day, great impetus has already been given to the application of the Oxy-Acetylene Blowpipe in this country. In fact, the development which has taken place in the past month or two has been most remarkable, and it may be predicted with certainty that welding by means of the Oxy-Acetylene Blowpipe will ultimately become a very important factor in mechanical engineering practice, and will be developed on a scale far exceeding anything that is now being done in Europe.

It is almost possible to foresee the time when every machine shop and engineering establishment of any magnitude will be equipped with an Oxy-Acetylene welding plant.

Oxygen may, of course, be generated by chemical means on the spot, and indeed there are at the present moment a number of such small chemical plants in daily operation, with more or less success, in conjunction with Oxy-Acetylene welding equipments. A somewhat complicated and frequently uncertain chemical process is obviously entirely out of place in an engineering establishment, and it would seem that other things being equal it is far more rational for supplies of oxygen to be obtained, ready for use, from some outside source. Apart from the space occupied by such a chemical plant to produce oxygen, there are other disadvantages, among which may be mentioned the trouble of periodically cleaning out and recharging the retorts and the oxygen producing plant, necessitating a continual expenditure for labor, besides the wear and tear of the parts themselves, due to corrosion and burning out. In some cases, also, there is a very objectionable refuse to be disposed of. Furthermore, it must be borne in mind that the oxygen thus produced is by no means pure, and requires filtration and scrubbing before it can be used. It has then to be compressed, necessitating not only some source of power but a continual repacking and renewal of working parts from time to time.

It is true that attempts have been made, so far, without very marked success, to generate oxygen under pressure by chemical means, but it is obvious that the results obtained in this way must be uncertain, apart from any question of risk.

The possibility of the deterioration of the raw material with age and exposure must also be taken into consideration, this being quite an important factor in many cases.

It will thus be seen that the generation of oxygen by chemical means is a considerably more involved process than the production of acetylene, and it is self-evident that unless oxygen can be obtained ready for immediate use without the complications attendant on the running of a chemical plant many engineering establishments will have diffidence in taking up the welding process.

Recognizing all this and that there must be a growing demand for oxygen if it can be supplied to the consumer under high pressure ready for immediate use and in a convenient and portable form, the Buffalo works of the Linde Air Products Company have been established on a very large scale indeed. With an equipment of cylinders which runs into many thousands the company is now prepared to supply every possible demand.

The oxygen supplied by this company is guaranteed to contain not less than 95 per cent of pure oxygen, the balance consisting of the ordinary nitrogen constituents of the atmosphere. It is shipped under high pressure in solid-drawn, seamless steel cylinders of special construction which comply with the amended railroad classification regulations. For industrial application the largest size of cylinder, which contains 100 cubic feet of oxygen under a pressure of 120 atmospheres, is most convenient. Furthermore, with a view to minimizing the delay arising from long freight hauls and insuring prompt delivery of cylinders containing compressed oxygen the company have introduced an "exchange-sale" system. For the convenience of the company's clients who have purchased cylinders from them—thereby obtaining the benefit of reduced rates and avoiding rent charges—the company will, if so desired, supply "full" cylinders on receipt of bills of lading covering the return of an equal number of similar "empties," providing the latter have been despatched freight prepaid.

The Chairman: Mr. Davis, have you anything to say on that subject?

Mr. Davis: I have a paper. I will step up to my room and get it.

The Chairman: I was not asking for your paper for the moment. We can use that to better advantage at some other time. I thought probably you could say something on this paper; it is open for discussion.

Mr. Davis: I don't know that I can say anything, Mr. President. I will say that the Linde Air Products Company is the largest producer of oxygen in this country at this time. I have mentioned several others in my regular paper. They are certainly doing more in that line than any one else.

Mr. Gannett: We might add that they have an Oxy-Acetylene demonstrating room, and any one going through Buffalo might find it of interest.

The Chairman: You have heard Mr. Lightfoot's paper. What is your pleasure?

(Moved and seconded that paper be accepted by the association, with their thanks.)

Motion carried.

The Chairman: I think, gentlemen, we will now hear from Mr. Morrison, outlining the entertainment features connected with this meeting, and after we have heard from him we will be glad to have each gentleman and lady present register. After that we will adjourn the morning session. Motion for adjournment will be in order at that time. Mr. Morrison, we will be glad to hear from you now.

Mr. Morrison: It gives your secretary a great deal of pleasure to be able to say that the entertainment side of the meeting promises to be very well developed. The program will be interesting, I think.

This afternoon the ladies will go to the Art Gallery, and the committee in charge of this matter, a committee of three ladies who have kindly offered their services, will take that matter fully in hand and will probably go during the afternoon session.

As for ourselves and the ladies, we are to have a moonlight excursion this evening. We are all to meet in this room at 7:30, in order to take a boat, the "Theodore Roosevelt," where space has been especially provided for. It is very gratifying to see that the weather man is our friend and promises a clear, full moon, so that the excursion is going to be delivered according to schedule.

The sessions tomorrow will be two, morning and afternoon. In the evening we are going to the theater, which is right here, practically in this building, to see the

"Top o' th' World." There is nothing too high for the acetylene industry, and I think it will be very enjoyable. Some of the members urged particularly that we should get front seats, after seeing the bill-heads; the more conservative members wanted to be near the center. So we have reserved a section near enough to be enjoyable and far enough away to be proper. So the association is well guarded and governed.

The program for the next day will be one session, and possibly a second short session. It is to be presumed that the sessions will commence promptly at 10 o'clock in the morning, and meet at such time as the association may designate for the afternoon sessions. On the third day, the first session will start at 10, and if we have a second it will start early enough so that at 4 o'clock we can adjourn and take automobiles, which will be in front of the door, to give us a ride, showing as much of Chicago as can be seen in the limited time at our disposal.

The ladies are invited to all the entertainments and are expected to attend, with the possible exception of the banquet. That has not been decided, for there are some difficulties in the way. We want to hear from each individual member before we settle that matter. The automobiles will take us on the ride and return the members, as a whole, to the Chicago Athletic Club, where dinner will be served at 7:30. I can assure our good friends that "Carbide Dividends" will be served in order to attract all the members who have a peculiar interest in the carbide business, and the good things which the club has in store for us are to be brought out, together with floods of wit and reason, such only as this association can produce.

So that, gentlemen, constitutes in brief the full program.

The Chairman: Gentlemen, I am very glad to say that we have with us this morning Mr. A. R. Nordvall, general manager of the Gas Accumulator Company, of Stockholm, Sweden, and I am very glad to welcome him to the association meeting here, and will be glad to have him say something to us about things on the other side.

Mr. Nordvall: I beg to express that I am very glad to come over here and join your association and would be glad to bring greetings from here to the acetylene association in Sweden, the president of which I am.

Mr. Morrison: I have here a cablegram from our fellow member, Mr. Berger Hammar, of Hamburg, Germany, who sends cordial greetings. Mr. Hammar always expresses his regret not to be present, and sends a cordial remembrance of the day of our meeting. The secretary has been in correspondence with him and urged him to come over to this meeting, but he is unable to do so because he is making a special business tour that he could not interrupt.

In order that the register may be complete, I trust that every one present will register this morning. I have here the entertainment tickets, according to our regular custom, and I shall be very glad to distribute buttons which bear numbers so that every member can identify every other member by looking at the list which will be published after we get the names.

(On motion, duly seconded, the meeting adjourned until 2:30 p. m.)

August 10, Afternoon Session.

Meeting called to order at 2:30 p. m.

The Chairman: Mr. Morrison, the secretary, is obliged to leave the meeting for a short time this afternoon, and I will ask Mr. Collins if he will act as temporary secretary.

The program committee, of which I believe Mr. Morrison is chairman, hands in this program:

On Monday afternoon there will be papers presented by Mr. Stinson, of the Acetylene Contracting Company, Minneapolis; Mr. Rose, of the Acetylene Apparatus Manufacturing Company; Mr. Ummach, of R. Williamson

& Co., and Mr. Ostby, of the Commercial Acetylene Company.

On Tuesday morning paper will be presented by Mr. Brock, on "Burner Troubles; the Cause and the Remedy," and a paper by Mr. Kirchberger, on the "Ethics of Selling Goods." Professor Pond, of the State College of Pennsylvania, will present a paper on "New Uses of Acetylene." Then we will have also the report of the Press Committee and the report of the Carbide Committee.

In the afternoon paper will be presented by Professor Mertes, of Notre Dame University, and paper by Mr. Davis, of Davis Acetylene Company. A paper by Mr. Morrison will be read at the afternoon session also, and one by A. F. Jenkins, of Alexander Milburn Company, of Baltimore.

At the Wednesday afternoon session a paper will be presented by Baron von Swartz and one by Mr. Merrill, of the Underwriters' Laboratories.

There will be one or two other matters brought up for discussion at the Wednesday morning session, and the afternoon will be devoted to the election of officers for the ensuing year.

This is a general outline of the program of the meeting, which will be adhered to as closely as possible.

Mr. Morrison: I have a number of names to present for membership: H. J. Hughes, Isaac W. Higgs, S. C. Challman and A. R. Nordvall, the latter for an associate member; the others for full membership.

The Chairman: Gentlemen, you have heard the names read for membership in this association. Do you want to vote on them separately or all together?

Mr. Kirchberger: I move that the secretary be instructed to cast a ballot for the election of these new members.

(Motion was seconded.)

Carried and ballot cast.

Mr. Stinson: Mr. Chairman, gentlemen, at the request of Mr. Morrison, I agreed to present a paper on town lighting, although I do so with more or less diffidence, meeting with you as a new member in the association, although somewhat older in the acetylene business. Still, I will take your time for a few minutes.

ACETYLENE TOWN LIGHTING.

By W. J. Stinson, Minneapolis, Minn.

The advantages of acetylene as a means of lighting towns of any size, but more especially those of 2,500 or less population, are becoming more apparent and are more generally recognized as we become more familiar with not only the good points of acetylene, but also with the defects of other systems of lighting.

Let us consider the essential features of a satisfactory town lighting system.

The service should be continuous and uniform.

The light furnished should be of good quality.

The cost to the consumer should place it on the list of necessities rather than among the luxuries.

The profit to the owners of the plant should be sufficient to warrant the investment of capital in the enterprise.

The cost of construction should be proportionate to the size of the town and not so excessive as to prevent the payment of reasonable dividends.

How do the various lighting systems meet or fail to meet these requirements?

Coal gas and water gas are adaptable only to cities of considerable population where a large output can be consumed, as it is not possible to produce these gases on a small scale except at an exorbitant cost, and the quality of the gas is variable when produced on a small scale.

Oil gas in immediate proximity to oil fields or refineries is slightly more feasible than coal or water gas, but the operating expenses of the plant and the first cost of the oil make gas cost too much to be sold at a reasonable rate.

The cost of construction of any of these systems of lighting is too high to permit their use in the smaller towns. There has been a prevailing idea that electricity was the proper source of light for the town which could not support a gas plant and on this theory hundreds of towns have, to their sorrow, experimented with electric light. It may safely be assumed that few towns of less than four or five thousand population have been able to meet the operating expenses of an electric plant, whether operated under public or private ownership, and being unprofitable it is impossible to supply a satisfactory service. Usually the electric current is supplied only during a few hours in the evening, the light is not the best, and the price is so high that few can afford to use it. The limited revenue will not warrant the installation of a really serviceable plant; to install machinery in duplicate is too expensive and when a break-down occurs the town is left in darkness until repairs are made. Such conditions have not helped the reputation of electricity and the result is that those who, through total ignorance and lack of experience, championed the cause of electric light, are now profiting by the mistakes and expensive experience of their neighbors, and instead of going blindfolded into an electric lighting deal, are looking around for something more satisfactory and more profitable. Gasoline for a time made slight headway along town lighting lines, but it has been thoroughly tried and found wanting, and is no longer to be considered among public illuminants, because, in addition to its many shortcomings, the price of the raw material makes the cost of gas production prohibitive.

With these difficulties in the way of success in the use of the older illuminants is it any wonder that there are thousands of good towns in the United States that are plodding along in darkness?

In recent years, however, acetylene has come to the front as an illuminant for public use, supplying all the demands of a town in the way of street, business and residence lighting, as well as supplying fuel for cooking and other domestic purposes. This system of lighting "fills the bill" and leaves little or nothing to be desired. If this is true one would think there would be so much business for the acetylene town lighting promoter that he could not handle it all, but we find that it requires continuous and persistent effort on the part of the promoter to get the business. We find town councils, bankers and capitalists generally, somewhat conservative in the investment of their funds. They have looked into the lighting business to some extent and have decided that the propositions heretofore presented were not desirable, so we must expect them to investigate the claims of the acetylene enthusiast very carefully before taking up with his ideas. Fortunately, acetylene will stand investigation, no matter how close or careful, the only danger being that the investigation will not be careful enough. It is found that acetylene supplies a satisfactory service and first class light at low cost to the consumer; that the first cost of the plant is less than that of any other system of equal capacity; that the operating expenses are next to nothing; that the repair bill is cut out entirely and the only thing to be considered is the cost of carbide, the amount of revenue it will produce and what margin of profit will be left for the payment of dividends. The general price of gas in the hundreds of towns lighted by acetylene is 1½ cents per foot, and at this price it is satisfactory to all consumers. Some towns sell at 2 cents per foot, but these prices prevail in districts where other illuminants such as coal oil are proportionately high priced. If gas is sold at 1½ cents per foot and the plant is of proper construction throughout and work done as it should be, the lighting proposition will yield sufficient profit to satisfy the investor. It must be borne in mind that one of the most important considerations in the successful operation of a plant is the feature of profit. Some urge the sale of gas at cost or nearly so where the plant is municipally owned, but such a policy is not based on sound business principles. It matters not who owns the plant, it should show a reasonable profit. If an enquirer is told that an acetylene town lighting plant has been losing money or barely keeping even with the game, does he stop to enquire whether the gas could have been sold at a higher and profitable rate and still satisfy the consumer? Oh, no! He says "Acetylene is no good, there's nothing in it; I wouldn't invest any of my money in such a scheme." Gas should be sold at a profit, but not at an exorbitant price. By striking the happy medium in price the acetylene business in general will be benefited.

Some people have the idea that acetylene is not desirable as a fuel gas. They get this idea from acetylene literature, which lays stress on the fact that the illuminating flame gives off very little heat. While this is true of the illuminating flame owing to its high candle power and the small amount consumed, still it might be well to emphasize the advantages of acetylene for cooking purposes.

Acetylene when used for fuel at a cost of $1.50 per hundred cubic feet will compare favorably with ordinary city gas at only a slight advance and will surely satisfy the consumer. While a given volume of acetylene contains about three times the number of heat units contained in a like amount of coal or water gas (the kind ordinarily used in cities) its cost per volume is greater. This greater cost, however, is practically overcome by the peculiar character of the acetylene flame, which makes it possible to burn acetylene at a higher efficiency than is possible with any other illuminating gas.

Owing to the requisite amount of heat being confined to a small volume of gas, the flame covers but a small surface and the vessel to be heated may be brought closer to the flame, the result being that all of the acetylene heat is utilized, none of it escaping around the sides of the cooking utensil, while it will be found that possibly one-half or even more of the heat of the city gas or gasoline flame is totally wasted as it flares up around the sides of the vessel, where it does little good.

I have in mind a town of 10,000 population, Bonham, Texas, where in addition to the consumers of gas for lighting purposes there are a great many families using acetylene for fuel. The price is 1½ cents per foot, and all are satisfied. The Bonham plant was built over three years ago and has been operated in competition with an electric light plant, which also supplies power to the street railway. The list of acetylene consumers has been recruited from the patrons of the electric light plant and the patronage is steadily increasing. When it is stated that not a single customer of the gas plant has ever been lost it will be a sufficient comparison between the two systems.

The success of acetylene in towns of 10,000 population or larger would indicate that it may successfully be used in cities of any size, but most of the larger towns are already supplied with a lighting system of some sort, while the smaller towns are not, and as it is but natural to follow the lines of least resistance the promoters' efforts are directed toward the points of total darkness rather than to places already partially illuminated.

It is frequently observed in towns where acetylene town lighting plants have been installed that many business places have, previous to the advent of a public system, been lighted by gasoline lamps. These gasoline outfits, when they can be made to operate at all, give a very brilliant and high candle-power light. True, they are noisy, hissing, foul-smelling affairs, but they have educated the user to believe that he wants a powerful, glaring light. The same is true where electric arc lights are used for indoor lighting. There is a way to overcome this prejudice in favor of a glaring light, or rather to supply the demand for it. The open flame acetylene burner gives the mildest, softest and most mellow artificial light on earth, but when we use a mantle on acetylene we produce a result as remarkable as that produced by the application of the mantle to coal gas. Mantles of various sizes are used, ranging in gas consumption from one-sixth to one and three-quarters feet per hour. We have used and are using a great many incandescent mantle burners and are using them with as great success as that which attends their use with coal gas. The mantles are neither more nor less durable than the ordinary city gas mantle. With a mantle burner consuming one and three-quarters feet of gas per hour we brilliantly illuminate 20,000 cubic feet of space. A one foot mantle burner will illuminate about two-thirds as much space, while a one-quarter of one-half foot mantle will light the living room of the ordinary residence as bright as day.

In speaking of acetylene town lighting plants I refer to actual town lighting plants of the legitimate order and not to the so-called town plant which consists of an automatic generator placed in a store or cellar and supplying light to two or three neighbors on either side. A town lighting plant should be constructed on a permanent basis and of such materials as will insure its life being at least as long as that of the ordinary city gas plant. Many acetylene generators have been labeled "Town Plants," when their construction was such as to bring not only the plant itself but also acetylene into disrepute.

To the generator salesman there is a great temptation to sell anything that will make him some "ready money," and he frequently runs across a town which without much effort may be induced to invest in a town lighting plant. To install the right sort of plant might cost several thousand dollars more than Mr. Salesman believes it possible to raise, easily, for the purpose. He knows that his fifty-light automatic generator gives satisfaction in a store or residence and he figures that by allowing one of these generators to attain a larger growth it will develop into a town lighting plant, so he sells and installs one of his overgrown, household generators for this purpose. He is getting a very moderate price for the outfit, so he proceeds to lay his system of gas mains just "any old way" to get them in and save expense. He pays no attention to grading, makes no provision for condensation and possibly has never heard of expansion or contraction of mains. The final result is that although the plant started off very nicely and possibly pleased everyone interested, a great many leaks have developed, pipes have pulled apart, mains have filled with water at some points or may even have frozen and burst. The plant has occasionally failed to supply gas, just as any other automatic generator may occasionally or semi-occasionally fail. If a man who owns a private lighting plant should forget to recharge it, or if, for any reason, the automatic mechanism should fail to "automat" and should leave him in darkness, he is the only sufferer and has no one to complain of or to except himself. When the so-called town plant so far forgets itself as to run short of gas there is a vigorous kick made by every man, woman and child in the town, and acetylene is voted a failure. Of course, it may be contended that an electric light plant would do worse still, as such plants frequently go on strike for a day or a week at a time; but it must not be forgotten that we have been claiming for acetylene great superiority over electric or any other lighting system, some of the grounds for our claims being that it is *always on duty* and *never* fails; is economical for the consumer and profitable for the producer. If through faulty or careless construction all of these claims fall to the ground has there not been a mistake made in the installation of such a plant? It is not necessary to build town lighting plants that are defective. They can be built *right;* and would it not be advisable to make no town lighting contracts that are not right in every particular, refusing to install a plant unless it can be done at a price which will permit of a satisfactory system being built and nothing but the best materials and workmanship used. It is also necessary, to employ experienced workmen in the construction of a town lighting system. Those engaged in the business know from personal experience that there is a great deal to learn. Having entered the acetylene business fourteen years ago and having devoted all of my time and energy to it since 1895, I realize that I have a great deal still to learn and that much of what I formerly thought I knew was all a mistake. I would not now care to use the same methods or material for construction that we did a few years ago. Experience teaches a great deal that can be learned in no other way, and sometimes it teaches us to forget some things we thought we knew. Without experience it is more than likely that mistakes will be made in the installation of a plant, and for this reason it is not good policy to advise or to permit local parties to lay gas mains. Acetylene salesmen frequently sell the generator and recommend the purchasers to lay their own mains and do whatever work may be necessary in connection with the installation of the plant. Plants installed in such a slip-shod fashion can not be expected to prove satisfactory. Another source of dissatisfaction is the installation of a small plant as a "starter" with the hope of enlarging it later on. In such cases it will be found that the deal being considered comparatively unimportant the outfit has been thrown together with little care or attention to details. The plant proves to be unprofitable and in many ways unsatisfactory, and instead of increasing its capacity it is thrown aside and some other means of lighting employed, or if the plant should finally be enlarged it is still a botched job. I had a conversation a short time ago with the owners of a plant which, when it was first installed, was about one-fourth the size it should have been. After operating it for a time it was decided that storage was necessary and the manufacturers of the plant were asked to add the required storage capacity. The matter being left to the judgment of the generator manufacturers they proceeded to install storage equipment, but the owners of the plant now tell me that they should have had three times as great storage capacity, and must sooner or later increase it to that extent. This bungled-up plant has been the means of losing several town lighting contracts because investigators get the impression that there is something wrong with acetylene or else it is still in the experimental stage. There may have been a small profit in the original sale of this plant, but the unsatisfactory results prevent not only the manufacturers of the plant but all others engaged in the acetylene town lighting industry from doing any business in that vicinity.

Now, then, can we best direct our efforts so as to advance the interests of acetylene town lighting?

Some may think the solution of the problem rests with the producers of carbide, as there is no doubt that a reduction in the price of that commodity has a marked tendency to boom the town lighting industry. It is not well to leave the whole matter to the carbide manufacturer, however. Carbide prices will be adjusted to the needs and demands of the day, and in the meantime there is work for the contractor and promoter to do. Let the contractor give his best and closest attention to the details of construction, which in themselves seem unimportant perhaps, but which in the aggregate mean the success or failure of the plant. Let the salesman use every effort to promote only the sale of the best than can be constructed. Remember that the town lighting business can not be conducted as a side issue of the generator business, or it becomes a case of the tail trying to wag the dog. Generator sales and town lighting contracts do not go well together. It leaves the door open for the exploitation of the "imitation town plant" as the "real thing" and the results are detrimental to the trade. Town lighting is a business by itself and to be successful must be conducted as such. Success is the reward of the specialist, and the man who will talk town lighting, think town lighting, believe in what he talks and understand what he is talking about, will be surprised to find so many interested listeners who are anxious to undertake a project which will benefit their town if it can be shown that it will at the same time benefit the investor.

The old prejudices in favor of electric light are rapidly disappearing and the people of America are awakening to the disadvantages of that system as applied to the community of moderate population. This being the case we should grasp the opportunity to establish acetylene in the public mind as the "The Light That Never Fails," the one and only satisfactory means of lighting the towns and villages of the United States.

The Chairman: Gentlemen, you have heard Mr. Stinson's very able paper on town lighting. Discussion is now in order.

Mr. Kruesi: Mr. President, I am sorry that Mr. Stinson did not tell us a little more about town lighting being profitable.

Mr. Stinson: Gentlemen, I will be pleased to answer any questions, I am sure, so far as I am capable of answering them. Now, with reference to progress. I will just refer back to some of the statements I made in my paper that if an acetylene plant was properly constructed, properly installed and built in every way as it should be, the plant will prove to be profitable. Now, I do not mean to insinuate that all the plants I have built are right. I presume that no person who has had any experience with this kind of business will claim that all the work has been done as it should be. But we are here to do the best we know how. At least we should make an effort to do the very best that our experience teaches us. I know that an acetylene plant can be made profitable.

Dr. Davis: I want to express one thought and that is that the town lighting business is a separate business, if it is a business at all. Theoretically, I think it will prove that there is nothing to compete in small town lighting with acetylene. It costs less to handle, it costs almost nothing to operate, the distribution costs almost nothing and you have a better and cheaper light. You can't put a large gas plant in a small town. I do not think that there is anything to compete with acetylene. You can't always make people believe that this is so. It seems to me that it is ignorance in the small towns and because of the failure of some plants that have been put in. I think that some of our best dealers have had the town lighting fever. Strange that we all get over it. We find that when dealers take up town lighting they entirely lose the business of the smaller consumers, and they lose a good deal of money. There are no exceptions to that rule. It seems to me that it is the ignorance that we have got to overcome in some way. We are sorry to hear of our dealers taking up town lighting.

Mr. Brock: Any of us who might be inclined to start town lighting would be discouraged. The question is whether town lighting plants pay at all. I would like some authoritative information on the subject—whether town lighting plants do really pay. I would like to know whether Mr. Kruesi could give us any information as to whether town lighting pays. We ought to get to the bottom of this.

Mr. Kruesi: I think there must be a profit in town lighting plants. I have been trying to find out what these contractors do consider a paying investment. Do you consider a town plant profitable making six per cent, or do you want ten per cent? You can't get figures on this. They are coming to me every day, asking whether an acetylene town plant in such and such a town would pay. I want to know whether it will pay. Is there such a profit that you do not want to tell us about it?

Mr. Stinson: Let me give you some figures. They say that figures can't lie, but liars can figure. You can figure this out any way you like. I will quote you an instance of a town where we installed a plant in 1902. We started the plant going the first day of January, 1903, and on the first day of January, 1908, according to the statement of the town clerk, or whoever was in charge, they had their records kept separate, an absolute record of all expenditures and receipts from the time of installation, that plant in those five years had paid the original cost of construction and $3,000 besides. That looks like a bright proposition; but you have to have a little further explanation or it looks too good to be true. Starting with one thousand people they today have a population of twenty-five hundred, and you can see how the profit comes in. They installed a plant to take care of one thousand, whereas they now have two and a half times as much. All the conditions are favorable. I know another instance where, in the early stages of the game I was so anxious to sell that I gave one plant away for half what it was worth. There was a small quantity of mains, a population of seven hundred and fifty people, and the owner of that plant got every business place in town, without any exception, and almost every residence in town. He sold gas for two cents a foot, and in three years had paid for the plant and had six hundred dollars to the good. His plant to start with did not cost more than one-half as much as it should have cost. Other towns have paid 10 per cent, 12 per cent and 14 per cent. I know another town where we built a plant for the price of $6,000. There were twelve subscribers of stock in the gas company. They put $150 a piece, a total of $1,800, and gave notes for $4,200 for the balance of the contract. I immediately turned things over to a local man. Now today in three years' time they have cleared off all but $1,060 of the $4,200, have paid $3,140 besides paying interest on the $4,200. Is that not doing well? I call that a successful plant. I saw a statement a few months ago of a plant paying 14 per cent in its second year. You must understand that 6 per cent way down on the Atlantic sounds far bigger than 20 per cent in the Northwest. Why, I don't care anything about 10 per cent or 12 per cent; if you can make 20 per cent or 25 per cent, we can talk business. It depends on the locality whether there will be a satisfactory dividend or not. You can adjust yourself to the conditions.

Mr. Gannett: I think you will find if you look over any list of acetylene town plants that the ones that are not paying profit are leaky. If the mains are put in so that they will be permanently tight and are run on reasonable business plans, they cannot help but make profit, but if not, they cannot help but lose. Two plants identical, one will be making 10 and 15 per cent and the other will be losing money, just on the way they are run and managed.

Mr. Wilson: I want to ask Mr. Stinson what, in a well constructed plant, he has found is a fair amount to put away for sinking, renewal and so on.

Mr. Stinson: I have personal knowledge of twelve or fifteen plants that have been in operation from four to eight years, and those plants have never spent a dollar for repairs. That is a fact. They have not spent a dollar for repairs in any way, shape or manner. They consider those plants in as good condition as when installed, and they know of no reason why repairs should be necessary. We cannot say how long a plant should last, as none of us have had experience beyond eight years. Within that time they require no repairs. I believe there is nothing to hinder the acetylene plants being made just as durable as any other. Acetylene mains could be made absolutely bottle tight. Tests made with three miles of mains which had been in four years, with seventy-five consumers, showed there were a number of leaks the time those meters were connected. By cutting off the meters, there was no sign of a leak for the three miles that had been down for four years, and the pipes showed no evidence of deterioration in any way, shape or manner. I think to say more than that would be probably guess work, but that comes within my observation and I know it is true.

Mr. Wilson: What do you use for pipe fittings?

Mr. Stinson: We do not use malleable fittings, as we find they are full of sand. We find the galvanized fittings save time and material.

Mr. Davis: I presume that the question in the minds of those who are not experienced in this line is, why does not town lighting progress faster? The answer is, in the first place, these little towns are so hard to get. There is a very large first cost in getting the franchise. If you give them an estimate based upon material cost and don't figure the heavy selling cost under such circumstances, they have got the price and there is nothing left in it. At least that has been our experience in town lighting all the way through. I would like to know whether I am correct in that idea.

Mr. Webb: The new members of this association do not like to speak. We are not interested in town lighting, but it strikes me off hand that perhaps these men who are interested in the town lighting business are not anxious for us to take hold of it. It seems to me personally that those who have stated the electric light conditions in this country, and every man in the acetylene business, is thoroughly convinced of one thing: that is it is only a question of a short time when conditions as they are today in all these small towns will be done away with. They do not pay and are unsatisfactory. It is for you men in the town lighting business to take the place of the electric light plants. You know you can do it, for if there is anything that can be done, acetylene men can do it.

Mr. Stinson: I just want to refer to a point you made there. You say that it looks as if those in the town lighting business would just as soon have others keep out. For my part, I would just as soon people would keep out if they don't go into it right, but here is the point: when a man goes into the town lighting business as a side issue, he has an idea he has got to compete with electric light and has got to put a plant up for one-tenth the price of an electric plant, but the thing is to give them what they need and get a price for it that will do the thing right. I can get $2,000.00 more than any electric concern in Chicago. No town in America of less than twenty-five hundred population can safely invest in an electric light plant. What difference whether electric plants cost more or less? Get a good price for a first-class acetylene plant and go ahead. When the ordinary house lighting generator salesman goes in the town lighting business as an experiment, he thinks he has got to cut the price in order to get business. It is that class of promoters that I am not anxious to see come in, but I am anxious to see good, legitimate promoters do it on the proper scale. I do not mean to say that I promote a better scheme than anybody else. But whatever you do, if you go into the town lighting business, do it right; make it pay.

Mr. Sadler: If any of you go into the town lighting business, make your price right and give them their money's worth.

Mr. Wilson: Mr. President, my relation to the town lighting business has been from the other side, for some time—a sort of attorney for the assured, as it were, expert for the man that is going to buy. My business is to visit the towns and tell them what they ought to do about it. We have served a good many towns, and, as far as I know, they are unanimous in saying that our service is all right—and some have had time to find out. In a great many small towns where the lighting problem has come up, my advice has been to let the electric light proposition alone. I have told them that each plant is a proposition all by itself. You can't generalize on that very much. They know I am in the acetylene business. Therefore, they assume that I can tell them something about acetylene. I have told them in a general way that unless they are willing to make a proposition for their acetylene plant based upon $8.00 per inhabitant, and build it well enough so that is about the price, if anybody comes along and offers it for very much less, unless the town is very compact, they had better let it alone. A plant put in for the permanent service of the town, with mains that are really mains, not merely pipes, put in all the way through ready for immediate connection, has something in view for the future, and I want to ask now whether that advice is very far wrong?

Mr. Stinson: I speak from experience and I say that you are giving them good advice.

Mr. Webb: My opinion is that the town that expects to get a satisfactory acetylene system for less than the price you named is going to get left, and will find that they have bought something they did not want. I think you will find that in nine cases out of ten.

The Chairman: The discussion has been very interesting. There are two points in Mr. Stinson's paper, however, that should attract our attention. One is the use of mantle burners, which he says are used extensively. I would like to inquire about what number are in use, how long they have been used and about what results can be had from those burners. That is, cost and candle power as compared with the naked flame.

Mr. Stinson: Were you asking for our experience? We have in use altogether between four and five hundred mantle burners. I do not know exactly how many. The mantles used are as delicate as the ordinary city gas mantle. I know of mantles that have been used continuously for over a year. Four or five mantles have been broken in replacing, just like you do with coal gas mantles. They are neither worse nor better. We have tested repeatedly and made comparisons between the open flame burner and the mantle burner, and we have found that a burner consuming a foot and a quarter an hour with the mantle on will give fully as much light as six feet burned through the open flame. That is not exaggerating at all, because I have tested that so often and in the presence of so many people who are all unanimous in this opinion.

Mr. Kirchberger: Under what pressure have those burners been burning which you have been watching?

Mr. Stinson: Three and one-half-inch pressure. Not less than three and a half-inch. You cannot burn the mantle burner satisfactorily on low pressure, nor on irregular pressure; you must have positively regular pressure.

Mr. Brock: My positive experience as far as candle power is concerned is that the very best I can get is 72 from a foot of gas. I find that acetylene destroys mantles and the incandescent acetylene burner is a rank fraud.

Mr. ————: I had some experience with the mantle burner which I sold for one year for the Harris Company of Cleveland, who make as good a one as any. I sold them in connection with my other burners. So many burners were returned that I quit the mantle burners. My advice to prospective purchasers of mantles has been that the mantle burner in the hands of an expert is perhaps all right, but in the hands of common users is a rank failure.

Mr. Kreusi: I have not had any experience with them yet, but I would like to. One trouble with the mantles is that they must be operated under considerably higher pressure than the open flame burners. The pressure must be the same in one installation. At this time I believe there is no better mantle than a mantle to which I own the exclusive rights. I am not doing very much until I hear the experience of other men. Some of them have had very satisfactory experience and others are not so enthusiastic. My own experience is that mantles will go to pieces in four or five days and they are a nuisance. You can take an open flame burner and burn it for four or five years. The ordinary incandescent mantle for acetylene is no better and no stronger than city gas mantles. I would like to know just what Mr. Kirchberger thinks about this.

Mr. Kirchberger: The open flame burner men have something to say in favor of the incandescent mantle. This burner to which Mr. Kreusi refers—we will agree that it is impossible to make headway with it in this country, has been successful on the other side, and it is only from the other side that we can get practical information. There are not as many incandescent mantle burners as there were two or three years ago. The conditions required for the perfect use of a mantle burner are absolute regularity of pressure and above all a pressure which is not given to the open flame burners. This country can only introduce incandescent mantles when it will adjust its entire outfit to fitting those burners. For that reason I do not think there is any great danger of the incandescent mantle burner covering general use in this country.

Mr. Sadler: It has been my experience that where you get uniform pressure all the time, as with the large storage systems, the mantle burners supplied by a town lighting plant will undoubtedly give you good service. I know of a number of mantles in plant in this state which have been in operation for over six months and are giving entire satisfaction.

The Chairman: Mr. Sadler, are there open flame burners on that same system?

Mr. Sadler: Yes. If I were putting in a system for a company, I would tell them that they did not want a mantle burner in a small room, but in a large room. I would recommend putting mantle burners in stores. There is one store in that town that is about twenty by eighty feet, that has three of these burners and they have lots of light. You could not do that with three open burners.

Mr. Collins: I would like to ask if there has been any progress made in automatic extinguishing devices in town lighting.

Mr. Sadler: I have not had any experience in that line, but I have seen some that have. There are systems in vogue which will turn all the street lights on from a central station and turn them all out. You change your pressure just a little in your station and that causes the automatic part of it to work.

Mr. Collins: My question is: Are they making any progress in that?

Mr. Sadler: I am not recommending it.

The Chairman: Gentlemen, if there is no further discussion on this paper, we will proceed to the next paper by Mr. Ummach on "The Manufacture of Acetylene Fixtures."

Mr. Collins: I have the name of George E. Brittain to be changed from associate membership to full membership.

Mr. Kreusi: I move the suspension of the rules and that a ballot be cast to make Mr. Brittain a full member. Seconded.

The Chairman: It is regularly moved and seconded that Mr. Brittain be elected a full member. All in favor make known by saying aye. Contrary no.

Motion was duly carried.

MANUFACTURING OF ACETYLENE FIXTURES.

By Charles Ummach.

The making of gas fixtures and brackets especially adapted for the use of acetylene as an illuminant, is quite as important as the construction of acetylene generators, but so little attention has been paid to the acetylene field by the fixture makers, and this accounts for the existing conditions, namely, cheap goods, sold cheap, with practically no effort on the part of the manufacturer to hide this fact. Of course, there are exceptions to this condition, as well as of existing conditions, and to bring about recognition and create a more important feeling that acetylene should be recognized as a commercial commodity, it behooves all acetylene jobbers and dealers to encourage such fixture manufacturers who are willing to put their capital and time against yours, but only on the strength that the fixture manufacturer can at least enjoy a reasonable return. It is not good business for one to actually see how cheap goods can be purchased, because we know that whatever the demands may be some one will at least try to do some better at the expense of the user. An acetylene fixture should be well made, properly tested, and guaranteed to be perfect in construction and material; such guarantee to be backed up by the manufacturer. There are at present a very large number of fixture factories well distributed throughout the United States and Canada; that is, they are advertised as such. Of course, the average dealer has no means of ascertaining the reliability of such concerns, hence it makes it rather difficult to apply as well as enforce a guarantee, but, experience being a good teacher, the manufacturer who will stick to honest made goods regardless of this cheap competition will win out.

Catalogues are mostly used to introduce the various designed fixtures. Such catalogues are invariably furnished the trade with a discount sheet attached indicating the jobbers' or dealers' discount. A great many of the manufacturers do not protect the trade, preferring to do business with all who are in the market for their ware.

There are, however, quite a few who absolutely adhere to trade protection and will only furnish the jobber or the dealer, who is in an established business handling lighting goods in connection with the same, with their catalogue and discounts that trade conditions demand; but the trouble is that the dealer at times does not think it necessary to co-operate with these trade protectors, and deliberately gives the catalogue sent him to some prospective customer, not even taking the trouble to remove the discount sheet, with the result that he is handling a fixture deal at a loss, and then gets sore because the manufacturer did not protect him. He never thinks of giving the matter a serious thought, forgets all about the catalogue, and it becomes public property in the whole community in which a deal of this kind exists, and they all soon become acquainted with the prevailing discounts and expect thereby to purchase their outfit on a large discount basis. Along comes some other dealer, possibly a traveling salesman, representing such concerns that make a practice of having traveling representatives, who discovers the manufacturer's catalogue in the hands of the consumer with all discount information. This is the initial blow of knocking a legitimate profit in the head. It will naturally disgust him, prevent him from doing business along a reasonable, profitable line, and he promptly notifies his home office of the existing conditions. They notify the manufacturer, who, up to this point, is innocent, but who has an awful time to square himself, as letters of explanation come too late, with the result that he is apt to lose a customer; and so it will be until the dealer is more discreet and is willing to co-operate with the manufacturer.

To encourage a manufacturer, treat him as you would like to be treated; that is, with all fairness. If you use his catalogue it is evident that you are satisfied with the general compilation of such catalogue; then give the manufacturer, who had the courage to go to such an expense in the issuing of such catalogues, every opportunity to fill your orders. Don't, for the sake of trying to save a small percentage, turn him down. You will find it expensive in the end, as in such cases it becomes necessary to substitute, and this leads to dissatisfaction. A manufacturer who will reasonably protect the trade invariably will endeavor to meet the general trade conditions, and such being the case you will have no difficulty in securing the best of service. Cheap goods, sold cheap, means trouble. Try and educate yourself up to a higher standard of fixtures. It depends entirely upon yourself and not upon your prospective customer. It is quite certain that a better class of goods will lead to a satisfactory result, and the best "ad" a jobber or a dealer can have is a satisfied customer. The average run of fixtures for acetylene installation are of the cheaper type. The reason given for this is that the installation, as a whole, would run into too much money. This may be true from a money standpoint, but not from a practical standpoint, as acetylene installations invariably are replacing the old method of kerosene lighting. The hanging lamps generally were treated quite artistically, in this way becoming a part of the decorative furnishings of the room, just as much so as a piano or an organ, but with these cheap goods you destroy the decorative effects, and while you may argue that the vast improvement of the illuminant is so far ahead of kerosene lighting, you must not lose sight of the fact that the greater part of the time the light is not in use, and the fixture must perform its functions in a decorative line; therefore, it is well to educate your trade up to as high a standard of gas lighting effects as it has been possible in the electric lighting field.

No doubt, if the manufacturer is properly approached with the assurance that co-operation is the slogan, instead of "How cheap can you furnish the goods?" I am quite sure that the ultimate results will promote the sale of many acetylene installations, and interest those who are ready for better conditions in both light and decorative effects.

Mr. Brock: I have had this experience myself and have been asked by customers what method to take to stop the sticking of gas keys in fixtures. I use the ordinary fixtures such as we use for city gas and they stick. Many preparations have been found to stop it.

Mr. Ummach: It depends upon the class of keys used in the manufacturing of acetylene fixtures.

Mr. Brock: I have had special hand-turned keys and they stuck.

Mr. Ummach: Then there is something wrong with the manufacture.

The Chairman: Do I understand that this trouble occurs with acetylene?

Mr. Brock: Yes; our customers write about it all the time.

The Chairman: Mr. Rose, probably you can say something about that.

Mr. Rose: That is caused largely by the class of keys used. They are too short.

The Chairman: If any other member would care to say anything on the subject, we would be glad to hear from him. If not, we will proceed with the next subject, "Frost Proof Generator Houses," by Mr. Rose.

Mr. Rose: I have prepared no paper on this subject as I don't know enough about it to write a paper. The idea was to bring the subject up for discussion to get some ideas, and especially to bring about some action by the association that would lead to tangible results. The feeling is that if a frost-proof generator house should be produced at a fixed price, it would be one of the greatest helps that could be brought about. There is no doubt that the solution of a frost-proof generator house is one of the most serious before the association at this time.

THE NECESSITY OF A FROST-PROOF GENERATOR HOUSE.

By P. A. Rose.

There is a crying necessity for the development of a well constructed and economical frost-proof generator house, which can be successfully used for outside installation and which will stand climatic conditions anywhere throughout the United States.

Individual effort has developed various principles which are used with more or less effectiveness, but there should be available for the use of every member of this association complete plans and specifications for frost-proof generator houses of such material as can easily be found locally in any part of the country. The cost should be figured out and, what is more, completed generator houses of the types finally decided upon should be submitted to severe tests during the winter, where recording thermometers would show exactly the variations of temperature and the real effectiveness of the protection.

Procrastination has played a large part, lack of individual initiative has had its effect, and the desire of individuals who have ideas on the subject, to reap the sole benefit of his thought on the matter, have conspired to delay the working out of this problem to a practical solution.

I think that the members of the association are quite capable at this meeting of bringing to bear upon this subject so many ideas that any engineer or architect could combine them and work out a perfectly satisfactory and economical frost-proof generator house. I, therefore, respectfully suggest that this matter be discussed, that we all contribute our quota to the subject to be made a matter of record, and that the association, through its Board of Officers, be instructed to have the plans properly drawn up, to have two or three generator houses constructed early in the fall, and arranged that proper and scientific recorded readings of the thermometers therein be secured. This is one of the ways in which the association can be of great use to its individual members. All the large industries are maintaining scientific departments through their associations, which are called upon to solve the practical problems which individual members find difficult of individual solution.

The Chairman: Gentlemen, you have heard Mr. Rose's paper. It is ready for discussion. It seems to me that the suggestion is worthy of some action.

Mr. Rose made the suggestion that Mr. Gannett be called upon. He thought probably Mr. Gannett had some knowledge of the plans worked out by Mr. Schleider.

Mr. Gannett: It is true that I did prepare a paper for Mr. Schleider last year, but it was his earnest request that nothing be said about it, because he has worked out a plan which he is going to get patented and spring to the public. His idea then, as far as I know, was simply a refrigerating device, built on the same general principle, but I believe that is going to be rather a hard proposition for an individual generator, especially in the northern part of the country, to build frost-proof generator houses. There should be enough heat generated to keep it warm until the next time the sun comes out.

Mr. Long: How about frost-proof caves?

Mr. Gannett: Out in every farming district you find frost-proof caves, two-thirds or three-fourths under ground, and it is very seldom that they have to put artificial heat in them. They usually have double doors.

Mr. Long: That is suited to a generator, is it not?

Mr. Gannett: Yes, except for the inconvenience of a large machine.

The Chairman: If there is nothing further to be said on that subject, we have a paper here from Mr. Shaffer, one of our members, who is not with us today, but whom you will all recall, on "Personal Experiences with Artificial Illuminants." I will ask Mr. Morrison to read it.

PERSONAL EXPERIENCE IN ARTIFICIAL LIGHTING.

By H. E. Shaffer.

My experience in artificial lighting has all been actual, and if gone into in detail would fill a good sized library with forty to fifty volumes of standard sized cyclopædias and the work still to go on to fill more cyclopædias.

When employed in other avocations through life I have usually been successful. In artificial illuminants by striking a "Hoodoo" have generally lost it. Still I have a soft spot for the illuminants.

I first became very much interested in artificial light when quite young. My school lessons gave me long hours at night work. Our best artificial lights then to work by were tallow candles, whale oil (burned in lamps giving a pencil flame), pine knots (burned in an open fire place) and a "slut" light, made by filling a saucer with lard, cotton thrums being laid in the bottom, their ends sticking up in one place, inside the saucer. By lighting the end of these thrums the heat of the flame would melt the lard in the saucer, the thrums would act as wick to draw the melted lard to supply the flame, giving a good light. Mother made the candles from tallow, home made. The lard was also produced at home. The pine knots were also from the farm. Everything used for light was obtained from the farm, excepting the whale oil. This was before the days of burning fluid, or kerosene oil. From my earliest recollection I gauged the standard of all our neighbors by the lights used at the evening table around which the family were gathered. At that time the family that gathered about a table whereon stood two or more lighted candles, excited my admiration. I at that time looked up to those who lived in a well-lighted house, were the house ever so small, or the people ever so humble. As time passed, I grew up, left home, and finally found myself a country merchant in a very small village. At this time burning fluid had come in, to make the best and most convenient light. Tallow candles, whale oil, the "slut" and pine knots had in a great measure been superseded by burning fluid. My lights in the store were only counter lamps using fluid, or tallow candles, standing about on the counters. The more customers I had evenings the more dark and dismal my store would appear, as the people standing up would tower above all my lamps and candles, and absorb the light. I argued I must have better lights. Lights must be up in chandeliers. But no lamps then in use or tallow candles gave strong enough light to light a store well when so high up as a chandelier should be hung in a store. Burning fluid was produced by using 1 part camphene, 2 parts 95 per cent alcohol, mixed together. Camphene was very explosive, so also alcohol. Mixing the two did not change their nature in this respect. I argued this mixture turned into gas and burned in chandeliers, must make a powerful light, the richness of the compound camphene and 95 per cent alcohol must make a rich gas.

I soon made it part of my business studying out and employing mechanics to make for me several different designed lamps intended for this purpose. I think we worked at this idea perhaps eighteen months off and on before we struck just exactly the right mechanism to turn this mixed alcohol and camphene from a fluid into a rich gas with a burner made expressly to consume the gas mixed with air, automatically. It worked automatically, all the gas was consumed as fast as made, the heat of the flame of the consumed gas made other gas, the combination was perfection itself, absolutely perfect, and much the best light up to that time. We burned four feet of this rich gas in one flame, and it was a very white, soft flame of fifty candle power. I was almost overcome by the unexpected great success of the undertaking. Alcohol at wholesale at that time was 38 to 60 cents per gallon. Camphene at wholesale was 48 to 75 cents per gallon. My recollection is this rich gas at the above lowest prices for alcohol and camphene cost less than $1 per thousand cubic feet. I became greatly elated. To use a broad, but not a common or polite expression, I thought I had the world where its hair was short. I had a few chandeliers and burners made by hand, put two in my store. People came from all the country about to see the wonderful light. My store business increased. I was the big man of the town; was elected supervisor of the town in spite of myself. By this time another year had rolled around. What capital I had was in goods in stock in the store and bills receivable from good retail customers. As I bought my goods in New York on six months' credit, naturally bills were maturing. My trade was increasing greatly (on account of the advertising received) by being the inventor of this wonderful gas lamp and burner which did the business of making gas without gas works and consuming it as fast as made, making a much better light than in use before, and at almost a nominal cost. It was plain to see I could not continue on with my store and attend to this gas business, especially as the gas business kept me away from the store, and divided my mind between the two propositions. I was fearful my capital could not stand the drain the two would necessitate. So the conclusion came, to sell the store and pay up my debts out of the avails, and go ahead, heart and soul, in the diffusion of this great light. By the time I had sold the store, collected in the accounts, and paid up all my New York liabilities, I found I had left to the good belonging to me a little over $9,000, as a cash capital to put into the lighting business. By this time another eighteen months had passed, and we were nearing 1860. I had been making a very few lamps and chandeliers by hand for a few people who would insist on having one or two, regardless of the extra cost of making them in a small way without patterns or proper tools. About this time the War of the Rebellion had broken loose. I went on in the gas lamp business. By having proper tools made to make the lamps and chandeliers it reduced the cost of the goods 50 per cent. But the tools cost $2,650 to start with. I balked at this. Finally agreed to give an order for lamps and chandeliers of $10,000, and not pay for any tools nor own the tools. It looked to me like saving $2,650. Pattern-makers thought they could have patterns and tools completed in sixty to seventy-five days, and wanted me to advance the cash for the tools, and they would hurry the work out on time. I advanced the money. The tools were completed in about three months. Lamp makers took them, and needed changes had to be made on trial in actual use, so that nearly three months more passed before we could deliver a lamp. In the meantime Government had taxed alcohol $2 per gallon, and the supply of camphene was entirely cut off. The wholesale price of alcohol had advanced to $2.75 per gallon and small amounts of camphene could be obtained at $8.50 per gallon, but no large amount could be obtained at any price. I had $10,000 in lamps and chandeliers fit for no other use save for this one purpose and the price of the material to make gas gone up out of sight. My good country store was gone, my money gone. My wife, myself and one little boy was my whole stock. I owed $1,000 more than I had, or could command. I did not realize then that all this was to be a complete loss. We figured the war would end in a very few months and alcohol and camphene would be as before. But another thing happened about that same time. Kerosene oil was being made from coal, and also natural crude oil commenced to flow from the ground in Pennsylvania, which would have been a great drawback to my gas light had not the war broke out. I held my lamps about two years waiting for the war to stop, then sold them per pound as old brass for $325 and glad to get that. The price of alcohol and camphene are away up yet on the top shelf, with very little camphene used, so far as I know. So ended one of my most flattering prospects in artificial lighting. No one wronged me, my invention was all right. Had outside circumstances remained the same as when the gas lamp was invented fifteen years longer, I would have made a pile of money. The rebellion cleaned me out. It is the pioneer who makes or breaks. The pioneer takes all the chances. Light to me is fascinating, and always has been, and I hope always may be to the end.

Finally a time came when acetylene lighting was made possible by the discovery of how to produce a calcium carbide in large quantities. It being new and in my line, I paid some attention to it. I was then making and selling oil lamp burners and central draft lamps patented by myself, on which I had a good trade. But the general report that the greatest of all lights had appeared, but that a suitable burner had not yet been devised to burn the gas, attracted my attention. In the fall of 1896 I gathered up all the different kinds of acetylene burners I could hear of, tested them and made others myself. None that I tested at that time were good to burn acetylene. It was in 1897 that I succeeded in inventing and making the true and perfect acetylene burner.

From 1884 until 1900, when I was engaged in selling oil lamp burners and oil lamps, troubles with customers were a plenty, and most aggravating. Large central draft lamps were a new light in the hands of the people as far back as 1884. The peculiarity of a central draft oil lamp is, when first lighted to set at once at full flame, as the lamp heats up, and the oil becomes heated, the flame increased in size to the extent beyond the capacity of the burner, which causes the lamp to smoke like a coal pit, and if left alone in that state ten to fifteen minutes it smudges the whole room, white curtains and all. If the individual lighting a lamp was unacquainted with this style of lamp, and left the room at once after lighting the lamp, there was sure trouble in store, and perhaps the next morning the lamp would be returned.

When kerosene oil burners and lamps were first put on the market the burners made a flat flame, the wick being out of sight, covered over by the burner cone was a flat wick (this was before center draft round wick lamp days). This flat wick kerosene lamp burner and lamp created a great furore wherever artificial light was used or needed. Kerosene oil at that time was $1 per gallon. At that price for the oil, it soon took the place of fluid lamps in use, as it was impossible to procure fuel for the fluid lamp longer, on account of the rebellion making it impossible to procure camphene.

Let me tell the experience I had with the first kerosene lamp I ever saw in use which made a flat flame. Losing $10,000, my all, in a gas lamp experience, had not driven away my interest in a good light. It had only slightly dampened my ardor. The moment I saw the lamp and the fine light it produced and at comparatively a low price, I was interested and purchased one, and two gallons of the bad scented kerosene to use in the lamp. After my purchase what was I to do with it? The conclusion come to, was to send the lamp and oil to my mother with instructions how to fill and burn it. Mother, I knew, was handy and ingenious with lamps, and all the old ways of lighting, and I could trust her to manage the new lamp with the bad smelling oil. I did not feel like taking it to my own home to use and test its worth, as my family at home had seen us financially ruined by the alcohol and camphene gas lamp business, and was actually opposed to my having anything to do with any light, more risky than a tallow candle. Had I become enthused, as was my home, that I should let others have to do with all pioneer artificial lighting and keep out of it myself, it might have been as well. But my mind ran in a different channel. A new light never got past me without being overhauled, analyzed and dissected. But back to the kerosene lamp I sent to my mother. In about ten days I stole away, all alone, and went to see how my lamp was doing. It was seven miles away. Arriving there, I found father at home, but mother was out to visit a sick neighbor. I asked father about the lamp. He said, "Wait 'till mother comes." We talked a few minutes, then I asked again about the lamp. Father said they had not used it. Why not? "Oh, I don't know." I knew at once something was wrong by father's answer. I called for the lamp again, and received the same answer: "Oh, wait 'till mother comes." I insisted on seeing the lamp, so finally father produced it. Such a smoky, awful looking lamp as that was, is hard to describe. Father's name for me was always "Son." He said, "Son, mother wanted to clean up the lamp and have me take it to you, but I said, 'No, don't clean it. I want

Son to see it just as it is, because he will not believe his lamp would smoke like this unless he sees it on the lamp. I took the lamp, cleaned it up, turned the wick down back in the cone so the top of the wick was down in the cone out of sight and just a trifle above the top of the wick tube, in under the cone of the burner; lighted the lamp, regulated the flame to the right size by turning the wick raiser a trifle, and there was a nice clean lamp, clean white flame, everything in order and a fine light. I saw the whole trouble and the cause of it at once, on seeing that mother had tried to burn the lamp with the wick raised so the top of the wick stuck up through the slot in the cone. She had used other oils and fluid and the burners used were not cone burners. In those the top of the wick was the topmost part of the whole lamp, but in this kerosene burner the wick was out of sight down inside the cone.

The one reason why a pioneer in lighting with any kind of a newly constructed burner always has had, and probably always will have an uphill avocation, is that general humanity engaged in all other kinds of business, does not understand the science of light, at least only about one in ten thousand, and that one who has a real scientific knowledge, has not the necessary practical knowledge of the manipulation of burners made, or why a burner of a particular construction is not the same as some other burner or burners looking much the same. Nothing counts as a certainty in business of any kind, but in the lighting business with the flattering outlook of my first experiment in the gas illuminant and also of my being the inventor of the first double tip diverging arms gas burner with a mixing chamber in the side of its arms, and all contained in one piece, it seems to me is an experience that none will envy. In the first case, had there been no rebellion there should have been a fortune in it for me. In the latter experience with acetylene. the end is not yet, and consequently experience will still continue in this, and I believe to a grand success.

The Chairman: Motion duly carried for adjournment until 10 a. m., Tuesday.

August 11, Morning Session.

Meeting called to order at 10:45.

The Chairman: Gentlemen, the treasurer's books are ready for the Auditing Committee. Mr. Carroll is chairman of that committee, and we will ask him to take charge of the books.

Mr. Collins: I have the name of Oscar H. Fogg, of New York, for associate membership.

(It was duly moved and seconded that secretary be instructed to cast a ballot for the election of Mr. Fogg.)

Motion was carried.

Mr. Carroll: As chairman of the Auditing Committee, I will be pleased to take charge of the treasurer's books.

Mr. Kirchberger: I spent the greater part of last night reading the minutes of yesterday's meeting and I find that they are incomplete. The treasurer forgot to mention that a kind donor has given a contribution of $500 towards the funds of the association. I move that this be accepted with sincere thanks to the Union Carbide Company. I think that this is the least that we should do in recognition of this gift.

Mr. Wilson: Especially in the early days of the organization we were looking around for $500 and did not get them, and I think that the whole association ought to feel grateful. I recognize this, not only as a great kindness on the part of the Union Carbide Company, but as a very distinct recognition of the fact that the association has not been in operation in vain.

(Motion made and fully seconded that vote of thanks be extended to the Union Carbide Company for the donation of $500 made to the association.)

Motion carried.

The Chairman: We are ready to hear the report of the Committee on Carbide, Mr. Davis.

Mr. Davis: Mr. Chairman and gentlemen: I will have to plead guilty for having neglected this report. I intended to get information, but have failed to do it. The most that I can say in regard to the Carbide Company is that they are gradually extending their warehouses, as you all know, and the production of carbide is becoming something that compels them to pay considerable attention to it, in order to keep up with the demand, and the demand is growing very rapidly. We are all fortunate that the Carbide Company has money enough to keep up the supply of carbide. The convention would be in a panic if it was advised that the supply was getting short. I can say this for the Carbide Company that, so far as our company is concerned, anything we ask for in the way of shipments, new depots, the supply of carbide, or complaints in regard to the size of carbide, have always been attended to with the utmost promptness. I do not think there is any difference of opinion in regard to the way carbide is being furnished. Of course we would like lower prices if we could get them. We used to be doing a very satisfactory business in burners. We are still doing a good business, but we are not making very much. If the price of Carbide were cut down to where the Carbide Company were not making such profits, they would not be able to make such efforts for the benefit of the whole industry.

The Chairman: You have heard Mr. Davis' report on carbide. What do you wish to do with it? Motion is in order.

(Motion made and seconded that report be accepted and filed. Motion carried.)

Mr. Davis: I would like to say a few words for the benefit of the Carbide Company, as well as the association, in regard to a matter which Mr. Collins reported to me a few days ago. The Carbide Company took the matter up very promptly, and I feel sure that the management at least does not approve of any such thing. I do not, personally. There had been found some quarter-inch carbide that was so fine that in certain machines it would run through—that is, it would run through very small openings. We called the attention of the Carbide

Company to the matter and sent them a can of the carbide. I think that the Carbide Company themselves would know that a thing of that kind might cause explosion. It certainly would if it kept running. I simply mention this fact; it is exceptional. I think we have only found one can in all our experience. The Carbide Company asked us to send them a can of it and we did.

The Chairman: Gentlemen, we are ready for the report of the Press Committee. Mr. Morrison is chairman of that committee.

REPORT OF PRESS COMMITTEE.

A. Cressy Morrison, Chairman.

The efforts of the association in the direction of giving greater publicity to acetylene have this year been more successful than ever. Owing to the fact that many of the articles which have had their origin with the association have been printed and reprinted, and as the publications have not been obtainable at all times, the list is necessarily incomplete. Nevertheless, we have been so fortunate as to secure pages of publicity in some of the most important publications, especially those of a scientific character. One notable attainment has been the publication in farm papers, papers devoted to country life, stock raising, etc., of a number of articles specially written to interest the consumer. The insurance and technical journals have given very considerable space to the modification of the insurance rules. The daily press, including the very best papers of the country, have discussed acetylene illumination in its various phases and in a favorable way.

The efforts of the association to secure publicity for our industry is aiding materially in bringing about the greater necessary change in public opinion regarding our illuminant.

We are extremely fortunate in having an industry which is not prosaic, but which on the contrary is very interesting. If articles are prepared relating to acetylene which contain that vital principle, "news," or which are full of information and instruction, we find that the publications of the country are only too glad to get them.

Your committee most respectfully recommends that this side of the association work be very markedly extended. This association could well afford to expend a large sum of money in order to make its Press Committee a literary bureau in the true sense of the word, and put the proper literary men at the service of its chairman constantly.

It is really remarkable the prestige which the association is securing in the minds of the most important governing bodies, whether it be state, city or national government, army and navy officials, insurance people, railway officials, etc. This prestige is largely secured and maintained by the increasing publicity which the association is securing; but, best of all, is the good opinion of the people at large, and we are securing this in great measure also.

Appended to this report is a list of publications which have favored us during the past year. The committee desires to acknowledge its indebtedness to the *Acetylene Journal* and to *Light* for their constant co-operation. Their loyalty and devotion to the industry is such that they are marked for special attention, and are therefore not included in the list given in the report.

LIST OF ARTICLES RELATING TO ACETYLENE AND KINDRED TOPICS WHICH HAVE APPEARED IN DIFFERENT PERIODICALS BETWEEN JULY, 1907, AND AUGUST, 1908.

During the period of time between July, 1907, the date of the previous report, to August, 1908, a large number of publications have given space to Acetylene, and the articles can be divided in three different kinds:

First: Articles on the general subject of Acetylene and its application to house lighting.

The September number of the *Illuminating World* and of the *Progressive Age* reproduced in full the paper on Acetylene Lighting by Mr. Goodyear.

The *Insurance Engineering* in their September number devoted twelve pages to the reproduction of a paper on Acetylene Illumination.

An article in the October number of *Country Life in America* on Lighting a Country House covered quite a large space in support of Acetylene.

The *Northwestern Agriculturist* in both issues of September 7th and 21st contains articles on Acetylene entitled Light in a Country Home, covering a full page of their publication.

A part of an article on Light in *Success* for October contained very enthusiastic words for this illuminant.

Illuminating Engineer for October reproduced in full the paper on Acetylene prepared by Mr. Morrison for the Boston Convention of the Illuminating Engineering Society.

The Insurance Observer, of London, issue of October 4, 1907, copied in full the article on Acetylene Illumination printed in *Insurance Engineering* of September 1, 1907.

An interesting half-page article on the Light question and containing information on Acetylene generators and house plants was printed in the *Southern Building Record* in November, 1907.

Farm and Fireside, issue of January 10, 1908, had a one column article covering fully Carbide, generators, and Acetylene Lighting for farm houses.

The St. Louis Post-Dispatch on its front page devoted one column to the subject of Economy of Acetylene Lighting, quoting instances of people located in St. Louis who had started using Acetylene in place of city gas and electricity.

The Farmer's Guide, in their issue of May 30, 1908, devoted more than a page to the subject of using Acetylene to light the farm home.

Second: Articles on Acetylene Welding and sundry applications.

The *Iron Age,* of New York, issue of September 20, contains an article on the Oxy-acetylene Blowpipe, covering almost two pages and containing very interesting data on the subject.

There is also an article in the issue of July 16, 1908, which covers very thoroughly the subject of portable Oxy-acetylene welding machines of almost two-page length.

The November number of the *Technical World,* of Chicago, gives two pages and two fine pictures to the tests on Acetylene as a Motive Power made by a New York Engineer.

The *Scientific American* has at three different times within the year published articles on different applications of Acetylene.

One article on Acetylene Buoys, covering a little over one page of space.

Another article was a full reproduction of the paper on Signaling in the Army by Acetylene, read at the Convention by Capt. Wylman.

The third one was a reproduction, also in full, covering one and one-half pages, of Mr. Morrison's paper on Acetylene, prepared for the Convention of the Illuminating Engineering Society.

The *Scientific American* also printed a small article with two pictures on the use of an automobile Acetylene light by a country doctor during an operation.

The *Popular Mechanics,* a Chicago publication, had an interesting article, with picture, on the production and use of Calcium Cyanamide, speaking incidentally of Calcium Carbide and Acetylene.

Portable Acetylene mine lamps and other lamps used for tunnel work were the subjects of articles, accompanied by pictures, in the *Manufacturers' Record, Railroad Gazette, Mines and Minerals,* the last mentioned published in Scranton, Pa.

The *Electrical Review* of February 15, 1908, published an article on the manufacture of Calcium Cyanamide, covering two columns.

The papers quoted below published at different dates, between July 1, 1907, and August 1, 1908, articles on various applications of Acetylene and kindred topics, running from forty lines to full columns:

Milwaukee Evening Wisconsin.
Ansonia (Conn.) *Sentinel.*
Washington (D. C.) *Herald.*
New York Herald.
New York Evening Mail.
Washington (D. C.) *Star.*
New York Journal of Commerce.
Boston Evening Traveller.
Detroit (Mich.) *Times.*
Washington (D. C.) *Herald.*
Baltimore Manufacturers' Record.
Seattle (Wash.) *Times.*
Winona Republic-Herald.
Philadelphia Record.
Grand Rapids (Mich.) *Herald.*
Elgin (Ill.) *News.*
Rochester (N. Y.) *Chronicle.*
Bay City (Mich.) *Times.*
Terre Haute (Ind.) *Tribune.*
Cumberland (Md.) *News.*
New York Commercial.
Princeville (Ill.) *Telephone.*
Progressive Age.
Brooklyn Eagle.
Benton Harbor Banner.

Los Angeles (Calif.) *Times.*
Nyack (N. Y.) *Star.*
Marceline (Mo.) *Mirror.*
Charleston (S. C.) *News Courier* (three articles).
New York Success.
Adrian (Mich.) *Times.*
Chicago News.
Indianapolis Farmer.
New York Sun.
Indianapolis Star.
La Grange (Ind.) *Call.*
Bay City (Mich.) *Times* (two articles).
Alexandria (Ind.) *Tribune.*
Troy (N. Y.) *Standard.*
Albany (N. Y.) *Argus.*
Chicago Review.
Coffeyville (Kan.) *Journal.*
Nautical Gazette (New York)
Seattle Post-Intelligencer.
Boston Herald.
Topeka Capital.
Chicago Daily News.
Amherst (Mass.) *Record.*
Louisville Courier.
St. Louis Post-Dispatch.
South Haven Advocate.
Indianapolis Rough Notes.

Third: Articles on Acetylene in regard to the Insurance Question, referring to the decision of the Board of Fire Underwriters regarding generators and storage of Calcium Carbide.

The Railway and Engineering Review of August 1.
The Insurance Press of July 29.
The Railroad Age Gazette of July 31.
The Scientific American of April 25.
Engineering Magazine, April, 1908.
Insurance Engineering, March, 1908.
New York Real Estate Record and Guide, June, 1908.
Journal de l'Electrolyse, March 15.
Light, March, 1908.

Metal Worker, March 7.

Insurance Press, March 4.

Iron Age, March 5, have published articles of considerable length regarding the new Insurance Regulations on generators and storage of Calcium Carbide. The articles vary in length from fifty to over two hundred lines.

The Chairman: Gentlemen, you have heard the report of the Press Committee.

Mr. Ostby: I move that it be accepted.

(Motion seconded. Carried.)

The Chairman: We would be very glad to hear from Mr. Brock this morning.

(Mr. Brock's paper.)

BURNER TROUBLES: THE CAUSE AND THE REMEDY.

Jno. M. Brock.

I hesitated somewhat before accepting your Committee's kind invitation to prepare the paper that I am about to read. The moment I read the title of the paper, I knew that in order to prepare it I would have to rap some dear friends very sharply over the knuckles. By dear friends I mean the carbide manufacturer, the generator maker and as well the burner maker. The burner maker, though, least of all. I would not care to say whether the carbide manufacturer or the generator maker is most guilty. I am positive, though, that they have both been very guilty, and guilty in this way:

The generator man effects a sale. The generator is installed. The installation is hardly complete when trouble starts. Then the generator man has a visit from a very angry customer. This customer makes a big kick. He complains of all sorts of things. The generator man listens patiently and at the conclusion of the customer's story says, "Well, I know my generator is all right; it couldn't be otherwise. The trouble must be that there was something wrong with the carbide." Then the carbide man hears something and he says, "I know the carbide's all right—I'm sure about that; so, if the carbide is right and the generator is right, the cause of the trouble must be the burner." Back comes the customer to the generator man and tells him what the carbide man has said. The generator man then begins to frown. Presently a look of intelligence appears in his face and he says to the customer: "You know, I am half inclined to agree with the carbide man; in fact, I wholly agree with him. The carbide man knows what he is talking about; by ginger, I think it must be the burner." And on the burner man's poor shoulders is heaped the whole of the trouble. The burner man must carry the final burden, and I want to tell you right here that burden is a mighty heavy load sometimes and it hurts to carry it, for in nine cases out of ten this trouble should be divided between the carbide man and the generator manufacturer.

I admit it is a difficult thing to make a good acetylene burner, but not difficult in the same sense as the construction of the generator, nor is it as difficult as the making of carbide. You, Mr. Generator Man, have a mechanical action to contend with, while you, friend carbide man, have chemical elements to deal with. Admitting that we burner men are not infallible, our chance to err is not as great as yours. We burner men have our responsibilities. We know there are faulty burners and lots of them; but please remember, too, that there are a lot of good burners, and these good burners are condemned as frequently as the poorer ones.

I expect this paper to be vigorously discussed. I'll be pleasantly disappointed if it is not. I look to you to tear it all apart, but I am going to have my say nevertheless. I am going to strike right out from the shoulder. I am going to deal with friend and foe alike, and when I am through I'm going to sit back and listen to your discussions and figure out how little you think I know about acetylene; but, no matter what you may call me or what you may say of me, when you are all through, I am going to invite you all to the most convenient cigar stand and ask you to have a smoke with me, just to show there is no hard feeling.

In this fierce struggle for business, and to meet a competitor's price, the generator man will often install a certain size machine when he knows a larger machine is required. It is needless to tell you gentlemen what will happen in such a case. You know, of course, the generator will be drawn on too heavily and burner troubles will follow.

As acetylene is heated, it loses its illuminating quality and if heated to a high enough temperature men that know tell us that 97 per cent of the acetylene disappears entirely. By disappearing, they mean the nature of it is changed and but 3 per cent is left unchanged. The effect of this heating is that the acetylene decomposes almost entirely into carbon. This is deposited and hydrogen is set free. The 3 per cent of acetylene which is not changed sometimes forms napthaline and this crystallizes.

I personally have made experiments. I have taken a ¾-foot burner, lighted it and then applied the flame of a blowpipe to the end of the burner arm. By continuing to heat the burner arm, I would decrease the size of the ¾-foot flame until the flame produced by the burner would be no larger than a pea. By metering the gas, I found that the volume of gas passing through the burner when heated was identical with that passing through the burner when normally cool, proving conclusively that heat has a serious effect on the illuminating value of acetylene.

The decomposition of carbide by water is very rapid and the degree of heat obtained varies with every form of generator. While the water may never reach the boiling point, the carbide may become red hot, the actual heat developed depending upon the rate of the flow of water and the manner in which it is distributed over the mass. It is common to have this temperature reach from 800 to 1,400 degrees Fahrenheit, and it is probable that in some parts of the mass a higher limit is obtained.

This statement may be questioned. I believe, though, it is correct. I have verified it by referring carefully to the work of Prof. Vivian Lewes and other eminent authorities.

These temperatures cannot be measured by the ordinary methods. Special precautions must be taken in measuring the heat evolved, for in most cases the very highest temperature only occurs in certain spots, and any attempt to take the highest temperature existing in a mass of carbide by means of a thermometer or by strips of metal of known fusing point are absolutely useless. It often happens that a thermometer in one portion of the charge will be registering a comparatively low temperature while a much higher degree is being developed in another portion.

In generators where excessive heat takes place tar is likely to cause considerable trouble. This product is very vicious in its character, and if condensed in the delivery tubes or pipes it causes the lime dust and carbon particles to collect and in time will bring about a stoppage, even of the larger pipes.

Where generation takes place at a very high temperature, benzine is carried forward in the form of a vapor and remains suspended even when passing through the system of piping. This benzine requires three times the volume of air for combustion that acetylene does, and the result is that the most perfect acetylene burner shows a tendency to smoke as soon as a quantity of this benzine is formed. Benzine vapor, as it commences to condense, assumes a fixed form, and in coming through the extremely minute holes which form the apertures of the burner, the friction there encountered causes the breaking up of these forms. This benzine is then deposited on the burner tips, and if these tips be made of a porous material, the benzine soaks into this material and carbonizes. After a short use, if such a burner is removed and the steatite portion broken, it will be found to be carbonized for some depths into the material, proving that the liquid hydro-carbon has been soaked into the material. The generator man and the carbide manufacturer, though, are not always responsible for this. Sometimes it so happens that the carbide is nearly perfect and the process of generation absolutely so. The gas is delivered to the burner comparatively cool, and yet there is not a proper yield of candle power. The loss of light in this instance is due to the burner. The construction of the burner is such that the burner head is abnormally heated. You know, of course, that a considerable gain in illuminating power of the burner can be made if the head of the burner is kept cool. This has been demonstrated by eminent French scientists, who constructed a burner having a small water jacket to keep that part of the burner cooled during burning.

Still, a great many of the burner troubles can be successfully overcome if proper attention is given to the temperature in the generator. If conditions are such that this temperature cannot be kept down and the generator is overheated, a well arranged scrubbing apparatus, which will get rid of the benzine, will be found a decided advantage and will stop a great many of the burner troubles.

If it so happens that trade conditions force you to install a smaller generator than should be installed, then for goodness' sake make some provision to purify the impure gas such an installation is sure to produce.

Sell your customer the generator, make your contract and after you have that nicely fixed, see if you cannot induce that customer to go to just a little extra expense and buy an efficient purifier.

I have made tests with burners using acetylene generated in the ordinary manner and used direct from the generator to the burner without passing the gas through a purifying material, and I have found that after three hours' burning a liquid is deposited on the under side of the burner tips. As the experiment continued, this liquid became thicker, and in so short a space of time as five hours one side of the burner became entirely choked.

The generator used in this experiment was of a type as is used on automobiles. No provision had been made to prevent the generator becoming overheated. I noticed at the conclusion of the experiment that the slaked lime was very yellow.

The next day I continued this experiment. In about an hour a slight deposit appeared on the burner tips. Shortly after carbon started to form and after six hours enough carbon had formed to distort the flame. I then cleaned the burner carefully and continued my tests with purified acetylene, taking my supply from a tank furnished by the Commercial Acetylene Company, and although I was using exactly the same burner as I had used in the test just described, I found no trace or sign of the liquid I mentioned in the previous test. My burner did not discolor and, of course, no carbon formed. This should positively prove the cause of burner clogging is more due to the condition of the gas used than to the burner.

I know of another instance where the same type of burner was used in exactly the same type of lamp with supposedly purified acetylene. Yet the results varied. The case I am referring to was met in actual practice. There were a number of like installations—a half dozen or more, In four of these installations, the burners gave perfect satisfaction. In two, though, in spite of all we could do, the burners would choke within a short time. When the burners which choked were examined, traces of the liquid as mentioned were found, and while I, as yet, have arrived at no positive conclusion as to the cause of this, I am led to believe, if the truth were known, it would be found that in the successful cases the gas used was pure. In the cases, though, where the burners clogged, the gas was impure.

I know the carbide manufacturer makes an honest effort to produce a high grade carbide, but this is not always possible, for it is practically impossible to obtain either lime or coke which are entirely pure. For this reason the carbide, and consequently the acetylene generated therefrom, is sometimes contaminated by other products.

Another impurity almost always present in acetylene which has been recently produced is the fine dust thrown off from the lime during the process of decomposition. This lime dust is so light and the particles so fine, that it remains suspended in the gas for hours, and unless special care is taken to remove it by filtration, this dust enters the supply pipes and eventually clogs up the burner.

No installation should be made unless provisions are made to filter the acetylene through cotton-wool or a like material in order to prevent any dust being carried forward from the generator to the burner. Some burner manufacturers try to guard against this dust by using wire gauze inside the burner. Some go even so far as to use raw cotton. While the gauze does practically no harm, I think at the same time it does really no good. The lime dust, being so fine, passes through the mesh of the gauze very readily and the gauze in no manner prevents the moisture passing through. The use of cotton inside the burner should be condemned, as it materially reduces the candle power and shortens the life of the burner by decreasing the pressure; consequently, the gas passes through the gas orifice slowly—sort of sluggishly. Not enough air is taken in through the air ports and the burner carbonizes. The proper place to put the cotton, or whatever material is used to filter the gas with, should be next to the generator at that point where the gas enters the piping system.

I will now take up the question of burner alignment, and let me, first of all, talk of metal arm burners, and so that you may know just where I stand in this matter, I want to say that although I have handled an immense number of metal arm burners, I have yet to find one out of alignment when the failure to be in alignment was due to the warping of the arms.

Now, kindly understand me; I am speaking now of all metal arm burners. I have seen metal arm burners as well as steatite burners out of alignment, but never have I seen a metal arm burner where the arms had warped due to the heat, and this is easily accounted for. There is never enough heat there to cause warping. To make you believe this, I will try and prove it.

I am now speaking of the particular metal arm burner that I am most familiar with. I have frequently tried to ascertain the temperature to which the arm of this burner was raised when in use. So far, though, I have not been able to find the proper instrument or method which would enable me to ascertain this temperature to any degree of certainty. A rough idea of the temperature, though, may be obtained in this manner:

If a drop of water be placed on a metal arm, and if this drop of water retains its shape, the temperature of the arm is so low that it cannot affect the shape of the arm. And, gentlemen, a drop of water can be placed on the metal arm of the burner I am referring to, and it will remain there and retain its shape, and, more than that, this metal arm burner may be in use for hours, and yet at any time during use, you can place your finger on the metal portion and allow it to remain there without any serious discomfort. Why, there is so little heat present the rate of consumption of the burner is not changed, positively proving that there is no contraction of the jet orifice.

Now, if a drop of water retains its shape, and one can place one's finger on the burner arm without injury to the finger, if there is no contraction of the jet orifice, does it not prove conclusively that there is not sufficient heat there to warp the metal?

Burners do get out of alignment, metal arm as well as steatite burners, but not due to heat, but due entirely to stoppage in the jet orifice or due to a change in shape in the gas outlet.

The material of which some burners are made is affected by the successive heating and cooling. Small particles of this material break loose from the main body and in time the gas outlet becomes ragged and rough. The shape of the jet of gas is changed. This change is unequal and as a result the two jets of gas do not impinge perfectly; then the burner is out of alignment and out of alignment beyond repair.

Some burners are made of a material which is porous. This material absorbs the products of acetylene. These products are of a greasy nature. As they are absorbed they are carbonized by the heat. Then the shape as well as the size of the gas orifice is changed and this causes the burner to become out of alignment.

Sometimes in the making of a burner the size of the gas orifice in the two arms is unequal; more gas is being delivered from one than from the other. Such a burner is not in alignment, nor can it be put in alignment. It is absolutely necessary in order to have a burner perfectly in alignment to have the same amount of gas delivered from each jet. When you see a burner with a streak running from the point where the two jets impinge, up through the center of the flame to the top, you will find, if you take the trouble to turn the gas partially off, turn it down to that point where the two jets separate from one another, that one jet is longer than the other, and this is the cause of that white streak.

As I said before, it is absolutely necessary that the same amount of gas be delivered from each jet. Under certain circumstances, a burner may choke up even when the gas contains no impurities. This happens when the combustion of acetylene is incomplete. If the air ports are not large enough, or not properly inclined, the intake of air is insufficient for perfect combustion, and the burner chokes up very readily. Perfect combustion is indicated by the color of the two jets of gas from the point where they leave the burner arm to the impinging point. These jets should be blue almost to the impinging point. If they are white or more the color of the flame, there is not enough air being taken in.

If the burner tip or burner head proper is heated to a temperature above a certain point, such a burner carbonizes very quickly, and this carbon will choke up the gas ways in a very short time.

The success of acetylene depends entirely on how faithfully we all do our respective parts. The carbide man must supply us with carbide that is as nearly pure as it is possible to make it. The generator man must give us an apparatus which is mechanically correct, and when planning an installation he must keep before him the need of making the installation sufficiently large to take care of every possible requirement. It would be a mighty good thing if someone in authority would make up a schedule that all generator men would work from—a schedule which would indicate the proper size generator for each installation—and if the generator men would get together and stop some of this fierce competition, it would remove the temptation to install a smaller generator when a larger one was necessary.

It should be the generator man's duty to see that the gas which is delivered to the burner is free of dust particles and that it is otherwise pure. If overheating could not be avoided, provisions should be made to purify the gas.

It should be the burner man's duty to supply a burner mechanically correct. By this I mean the air inlet should be of proper size and of ample size. The gas orifices or gas ways should be positively equal on each side of the burner. The burner tip or burner head should be of a material which is absolutely non-porous, so that the vital part of the burner would not be affected by coming in contact with acetylene or its products. The material should be of a nature which would successfully withstand the successive heatings and coolings that an acetylene burner is subjected to; and last, but not least, a burner so constructed that during burning the burner head or tip would be kept normally cool. Unless these provisions are made, all the good work of the carbide maker, as well as the generator manufacturer, will be spoiled by the burner.

The Chairman: Discussion of Mr. Brock's paper is in order.

Mr. Rose: I think Mr. Brock's paper is a little pessimistic. It seems to me to read like ancient history more than the present day. He speaks of the old troubles of the early type of generators. I don't believe that the troubles in Mr. Brock's paper indicate the present day.

Mr. Brock: It has always been my conviction that this is the very information that should be published.

If I were trying to sell generators, the strongest plea I would make to the customer would be to bring to his attention the number of bad generators on the market, and so would our burner friends, Mr. Kirchberger and the others. I think the customer should know, and I am sure the generator man should know.

Mr. Kirchberger: I agree with Mr. Brock, and must say that this is not entirely ancient matter. Mr. Brock does not expect me to agree with him as to the metal arm burners. This matter is left to the judgment of the audience. When it comes to burner troubles, burners burn perfectly when we use the three-quarter foot, but the half-foot smokes. We have our own troubles, but we want the other parties to carry their own.

Mr. Stinson: I do not know that I can make any remarks here that are of any particular value, but I am surprised to find that there are burner troubles, because we do not know of them. The best burners are quite satisfactory to us. We have no complaints. I am speaking from the town lighting standpoint. We do not hear of these burner troubles. The best burner made is perfectly satisfactory, and I have no suggestions to make or faults to find. That is my experience.

Mr. Collins: I never have any troubles.

The Chairman: It seems the troubles here are all on the part of the burner men. The generator men do not seem to have them.

Mr. Carroll: I would like to ask these gentlemen if they have any trouble with the burners after the gas passes through purifiers. I would just like to know if they really have any trouble after the gas passes through a purifier of felt or wool. I never heard of a complaint after that. If they have any trouble, I wish that they would let us hear about it. This is a matter of interest.

Mr. Wilson: I am a sort of has-been, but perhaps I can say some things for the ears of those who want to hear. I made a series of experiments and tried to determine this thing a long time ago, on the generators that were all right, that I knew were all right, and the generators that I knew were all wrong, and I have been doing a good deal of work with generators that are regarded by most people as impossible. I have been forced to the conclusion that the larger part are traceable directly to various kinds of foreign matter that lodge in and about these burners. We have used acetylene in our factory for a long time now—a little over ten years. In order to try the thing out and determine whether or not it was this foreign matter or something in the gas, we made arrangements like this: We operated generators with a wide variation of pressures. Long ago everybody was talking 22/10, then twenty-four, then twenty-six, and finally I made up my mind that if the gas is delivered under sufficiently high pressure it will dislodge these things right off as soon as you turn on the gas, and you will find that this will reduce your burner troubles tremendously. I think that is the reason our friend with the Texas town lighting plant does not have troubles over complaints, because he is producing all his gas at somewhere about three and a half inches. That will dislodge any foreign matter that would put the best generator on earth strictly out of business if it does not have sufficient pressure behind it. You can't get a worse condition for burners than on locomotives; I do not know of anything worse, where there is more dirt or trouble of all kinds. I have used a great many burners, some of them of makes that are condemned. Those burners stand up, but the pressure behind them is never less than three and three-fourths inches all the time. It looks to me like a mechanical difficulty more than anything else. Of course, the other thing that is going to make trouble is lime dust, but this can be removed by any simple material that will not mat. Personally, I do not believe cotton is good. I think animal hair is good, as it will not mat down. Hard felt is all right. I do not believe that wool felt is good. Hard felt will stand up. Lots of these packings will mat down and make a by-pass for the gas on the upper surface. I don't believe that the best generator on earth will work without some mechanical protection of that nature. I do not believe that they will work permanently and satisfactorily unless they have sufficient pressure behind them.

Mr. Collins: I would like to ask Mr. Wilson if he recommends that we increase the pressure. Ordinarily pressure is two and a half to two and three-fourths. I would like to ask what his tests show as to increased consumption.

Mr. Wilson: I would regard it as a good practice to maintain pressures at all times at something about three inches. I am not prepared to say three and three-fourths. Of course, in the early days, lots of burners could not stand that pressure. If we began to get above 2-28/10 then we began to quit. That was because the burners were not made with openings on two sides, as the later manufacturing methods produce.

Mr. Stinson: I agree heartily with Mr. Wilson's suggestion as to pressure. We have a theory that 26/10, I believe, is the proper pressure for acetylene. Let's get rid of impractical theories; results are what we want. If we find that a hundred consumers prefer high pressure to the results they get under low pressure, we had better stick to high pressure. I believe that three and a half-inch pressure or higher will give better results in saving expense. I would suggest that those who have had no satisfaction in the use of acetylene for fuel would find excellent satisfaction if they had sufficient pressure.

Mr. Kirchberger: Mr. Chairman, I would like to ask if this discussion as to pressure does not raise questions as to the consumption and actual cost of the maintenance of the plant. Will not increased pressure give increased costs? I think it is worth while looking into this, and would it not be well to let a committee look into it from all sides and report to the association at some future time? The question is far-reaching and should not be overlooked.

Mr. Carroll: This question of purification, American lava, etc., is rather interesting to me from a burner standpoint. In the early history of the business we had a good deal of complaint of burners clogging, and in order to intelligently answer those complaints we found it necessary to make experiments. We installed two machines, one of the old type and one of the present type—the type manufactured at the present time. We made tests extending perhaps a year, burning the burners continuously. With the old type of machine we had comparatively little trouble. The burners would clog up but would burn for a considerable length of time. When we attempted to run the present type of generator without a purifier, the burners would clog up in five hours with lime dust. We experimented under heavy loads and light, and all sorts of conditions in ordinary places. We found that in every instance by installing a purifier of a purely mechanical nature we could run the burners for several months; in fact, for years, running nine or ten hours a day. In every instance we stopped the trouble by the use of purifiers. Since then in every instance where we have had a complaint about burners we have advised the man to install a mechanical purifier for a dollar or two, and we have never had any further complaint from this man of the burners clogging. One point interested me in Mr. Brock's paper in reference to reducing the illuminating power of gas by increasing the temperature. He makes the statement that a blowpipe will raise the temperature of a burner at the tip and reduce the illuminating power. You so increase the volume of your gas that, while you pass the same volume, you would not pass the same quantity, and would not reduce the pressure. The quantity is the same but you increase the pressure. I do not think after the gas is generated you can affect it particularly. Anything that happens to the gas is done during the process of generation. After the gas passes into the holder it could not be affected, whether high or low.

Mr. Davis: A gentleman here would like to know, and I want to know, about the efficiency of a burner and what effect the pressure has on it. What is the recommendation of the burner men here as to the pressure? I would like to ask whether increasing the pressure will reduce the efficiency of the gas as far as lighting is concerned, and what the burner men here think is the best pressure to get efficiency?

Mr. Kirchberger: Without going into detail in regard to the actual efficiency of burners under various pressures, I would like to say that a one-foot burner that burns here on two and seven-tenths, and is used in the home of our friend from Sweden at three and a half or four, will give a slightly increased candlepower under the increased pressure. It is the difference between 200 millimeters, which is eight-inch pressure used in Sweden, and our two and seven-tenths, which is only two and a half to three candlepower to the cubic foot. On a three and a half pressure I would assume on an entire foot it would not exceed one-half. I discussed this matter last night, and what is used in Germany with a five-eighths to three-fourths foot burner is used in other countries with the exact drills with higher pressure and a one-foot burner. You have increased that from 30 to 40 per cent for a slight increase in candlepower.

Mr. Brock: I would like to ask Professor Pond if there is a loss in the illuminating power of acetylene after it is heated?

Professor Pond: In an offhand way, I should say that the remarks by Mr. Carroll are entirely correct and well founded, because the application of heat in the way indicated would certainly expand the gas. There would be no question about that, and the burners would, therefore, feed a much smaller quantity in the same time. It would be expanded in volume and would produce just the result he mentioned. If you heat it to an extremely high temperature, that could be done by passing through a very hot fire, there would be the expansion coupled with some decomposition.

Mr. Davis: I would like to ask Mr. Brock at what pressure he prefers a burner to be used.

Mr. Brock: I use Commercial Acetylene tanks and I work under about three inch; that gives the best efficiency. We made experiments, working under a number of pressures, and found the most convenient and the most efficient pressure was about thre inches.

Mr. Kirchberger: I think that the burner maker can adapt himself to the pressure required. We give him the pressure he wants, and we have a different line of drills for each pressure. The higher pressure is healthier for all concerned if the consumer is ready to foot the bill.

Mr. Davis: What pressure do you prefer?

Mr. Kirchberger: I would prefer three-inch pressure. I do not know of any other country that has less than three inches.

Mr. Davis: What pressure would you recommend, Mr. Carroll?

Mr. Carroll: Three-inch pressure.

Mr. Collins: I would like to ask the burner men what they think of the statement made by the insurance engineers that we must figure the burners to consume 25 per cent more than their real capacity. Now, the generator men and the burner men say that we get better results at three-inch pressure. Where are we going to land in figuring with the customer? The burner man says that it gives better results to weight our generators to three-inch pressure. If this is incorrect, if the insurance engineers are incorrect in their statement, I think it might be well to have them change their statement.

Mr. Davis: I move that, as per Mr. Kirchberger's suggestion, a committee be appointed to investigate this matter and report to the association later.

(Motion duly seconded.)

The Chairman: It has been regularly moved and seconded that a committee be appointed to investigate and recommend the pressure at which acetylene should be maintained to attain the highest efficiency.

Mr. Kirchberger: The motion is that a committee be appointed to make recommendation to the association as to the most advantageous pressure at which acetylene could be used in the United States from every point of view.

The Chairman: The motion is that a committee be appointed to report on the pressure on which acetylene could be used in the most advantageous way in this country generally. Ready for questions.

Mr. Wallace: The discussion has been all on the town lighting proposition. If the committee is appointed I would like to have them investigate the fuel proposition. That is a question that has been very interesting to me. In our factory we use twenty-nine to thirty tenths and we have no trouble at all in the fuel proposition. In nine out of every ten cases of complaints that we have in the fuel proposition we find that they are using very low pressure. If they are using more than thirty tenths they have no trouble, but if they go too low they have trouble. The proposition came up of a man that had tried every stove and a few burners that were on the market that he knew of, and he had had trouble everywhere. I found that he was using an old generator that is not manufactured now, and was using very low pressure. He was not able to get any results at all.

Mr. Higgs: I would suggest that the committee in making their investigations and discussing the matter take into consideration the size of the generator. Now, if you have a small generator and a large number of lights and are using a large amount of gas, you must necessarily have greater heat in the gas. It will not come so cool as it will from a larger machine. This largely accounts for the success of our friend Mr. Stinson and others who are putting up town plants. They make their gas and it is perfectly cool when it comes through the burners. That will account largely for their success along that line. I notice in my experience that a large generator that is not overworked never has had any trouble with us. We have got burners that we have been using between two and three years. They burn just as clearly as they did when we installed them. I think that has much to do with it, and perhaps it would be well to take that into consideration.

Mr. Wilson: There is another thing I think the average man installing generators has not paid attention to. It does not make any difference what your generator pressure is if the chump that pipes the building does not put in pipes large enough to maintain that pressure. There are many installations that I know about that are all right when they light the ordinary number of burners that are used, but on any special occasion if those burners are all lighted the pressure falls below what it should be and those burners go to the bad. That element in this matter ought to have a lot more attention than it has had in the past.

Mr. Johnson: In regard to this pressure proposition, I would like to say that for the last three years we have been weighting our generators to three-inch pressure, and in our town lighting plants from three and a half to four, and burner troubles are the least of our troubles.

Mr. Davis: I move that the committee be a committee of five instead of three.

(Motion seconded and duly carried.)

The Chairman: I will appoint that committee later on, if it is to be appointed at this meeting. We will leave that open for the present.

We will now have a paper by Mr. Kirchberger, on the "Ethics of Selling Goods."

(Reading of Mr. Kirchberger's paper.)

THE ETHICS IN SELLING GOODS.

M. KIRCHBERGER.

Mr. President: Shortly after my arrival in this country, just about twenty-five years ago, I was severely shocked by a newspaper's graphic description of the hanging of a murderer. At that time these hangings were big events for the newspapers, and every detail from the offering of flowers by the dear ladies, the day before the "festival," until the final disposition of the corpse, was published.

I wrote to a newspaper that such details were barbaric, and bound to have a demoralizing effect upon the public. I promptly received an answer, and this answer contained my first practical lesson in the ethics of selling goods. It read, "You are right, young man, but a newspaper is a business just like any other. You, too, no doubt, occasionally sell goods which are not agreeable to you, the use of which you may not approve, but you have to carry them as long as the people want them."

This was the beginning of "yellow journalism." I have keenly watched its growth ever since, and it has always been my strongest conviction that selling what people think they want has been one of the greatest demoralizing forces during the last two decades. It is an observation of comparatively recent date that after all it doesn't make people happy to get what they happen to want, but that their happiness depends upon liking what they really got.

A newspaper may get temporary notoriety, combined with a certain increase in circulation, by giving the "stuff" that they think people want, without making any allowance as to the intrinsic value of this "stuff." No newspaper has ever built up permanently either a circulation or a reputation on these principles.

Is this "yellowism" only characteristic of the newspaper business, or do we not find it practically in all stages of life? That statesman and that professor who deals in popular "goods," so to speak, is bound to be forgotten, but it is the dispenser of wholesome, sound, meritorious "goods" who will, after all, prevail.

No other rule applies to business. It doesn't matter what a man sells—there are opportunities in every branch to be either "yellow" or "white."

There are, as far as I can see, three ways of competing with or dislodging a competitor. One is by selling a really good, superior article; another by reducing the price, and a third by selling goods under false pretenses. Only the first of these three methods is an art. For the other two methods, no wit and no education is necessary, and this is, no doubt, the reason why they are more frequently employed than the first method.

On actual merits you cannot fool the public. The superiority of goods which meet in the market operates in itself as a natural power, as a conquering and eliminating force. It is the great battle of the "survival of the fittest." Battles which are fought on these lines cannot be either assisted nor interfered with by diplomacy, politics or trickery, and competition conducted on these lines necessarily commands the respect of the buyer and the seller.

The second method, that of reducing prices, is a very simple one. It is so attractive to pose as a public benefactor by offering goods at less than your neighbor. To be the champion of cheapness has always been a popular trick, and no demagogue who ever desired to come into public favor has failed to employ that trick.

No demagogue, no mischief-maker, ever earned public applause without promising the public something cheaper, and still cheaper. The history of Rome, from Marius and Sulla down to the fall of the Republic—nay, even down to the fall of the Empire—shows one incessant line of demagogues who sought for popular favor by offering something cheap—preferably breadstuffs, but sometimes also precious metals and real estate—and the history of the French Revolution during the existence of the Committee on Public Safety, shows that one demagogue followed the other by offering the howling mob "something cheaper" or something for nothing.

Recent history, and the methods of certain American demagogues, show that the trick of becoming popular by promising "something cheaper" has not yet been forgotten, but history fails to show that any of these demagogues could hold the applause of the masses for one minute after a still cheaper man appeared and made a bid for popularity.

Is it not remarkable that none of these political or commercial demagogues have ever been able to realize that more than one can play at the same game, and that they must invariably appeal to the conservative element when a more radical demagogue than they takes the field and steals a march on them by clamoring, "Still cheaper."

Take it as you will—I may talk politics, but I am talking business. If there is anyone here present who knows of an instance where people sold their own product at a ridiculously low price, because they thought that the people were entitled to get them at that price, I will be glad to stop right here. But you will all, no doubt, agree with me when I say that the objection to high prices invariably applies to the goods you buy, never to those which you sell, and you will also admit that it is a heap harder to build up a business by maintaining prices and securing a profit for all those who handle your goods than to destroy an industry by reducing the profits.

The price question cannot be dispensed with without reference to combinations, trusts, or any other commercial agreements which have been and always will be established for the purpose of taking off the sharp edge of competition, and maintaining acceptable profits. Human beings in private or public life, in high or low stations, are all unalterably opposed to all such agreements or trade arrangements or trust, or whatever they may be called, never mind in what line they may be. This applies to men in politics, to men dealing in every commodity known to the civilized world down to the cheapest kind of labor, with the one exception—and that is the line in which oneself is interested, and in conditions which are "different."

Do not misunderstand me. I do not intend to be sponsor of the idea that legitimate reduction of a price, based on an actual superiority or advantage in producing, is a crime, but I do contend that if the reduction of prices has no other purpose than to force down your competitors, it invariably acts as a boomerang in bad business, a disturbing and demoralizing element in the industry, and brings no one any benefit. One of the biggest firms in this country, if not of the world, have been built up on the motto: "Price will be long forgotten when quality will still be remembered."

Compare the seller who bases his offers upon something individual, superior, new, different, to the seller who has nothing else to offer but "same shape, same thing, guaranteed to do the same at less money." And this leads me to the third method of selling goods, *i. e.,* selling goods under false pretenses.

This method is resorted to by those who are unable to create a reputation of their own. Take the man who, not being known for turning out a good machine, sells his outfit with the earmarks of his neighbor's goods. His crime is a treble one: He cheats his customer, he cheats his competitor out of a sale, and he destroys the reputation of his competitor by distributing something inferior.

Do I exaggerate? This paper must remain free of personalities or I would give you some incidents of the workings of these fraudulent practices.

This is not to be a sermon, or I would also dwell upon the ethics in buying goods, with special reference to those who buy in order to resell and assist in a deception. Next comes the man who makes claims as to a superiority, which he knows doesn't exist. Of course, in the long run, these claims do not help the seller, if they are not made good, but while they are advanced, during the period of experimenting and education, they become a disturbing element.

The general and very popular expression, "My goods are as good as the other fellow's," seldom outlives a first transaction, as even the layman will soon be able to form his opinion as to actual comparative values. This is why the promiscuous claimers are always seeking for new expedients and for pastures new, where it is still possible to advance exaggerated or untrue claims, without danger of an early detection. If it must be, scientific phrases are thrown in, and I would not be a bit surprised to learn that it has been put up to the farmer to disprove that the light of the sun is now actually outdone. The poor man certainly could not disprove the statement either with a pitchfork or with a scythe. But here, too, it is only a question of time when the truth will come out. The seller using white methods is bound to get his day of reckoning with the "yellow" fellow.

Next comes the man with the Sunday-school face, who claims that his goods can do certain stunts which he knows they cannot, "though the other is a nice fellow, and his goods are not bad." I could go on reciting more or less permissible or odious selling tricks, such as "nice treatment," "unreasonable credits," but then I am addressing an assembly of business men who are in the habit of doing business on business lines, and can therefore afford to ignore these features.

The success in selling goods is governed by the one elementary law—the law of the "survival of the fittest." Against this law governments are powerless and anyone who opposes it is bound to be crushed. There can be no greater advantage to any of us than to settle down and adapt ourselves to this eternal law. Let us only sell what we know that we can deliver, and let us deliver the best that we can make, and let us get for this as much as the trade can afford to pay. The public itself will see to it that we will not get too much, and this same public has only a smile of utmost contempt for the fellow who does not know how to get enough.

Adjournment.

AUGUST 11, AFTERNOON SESSION.

Meeting called to order at 2:30.

The Chairman: I will ask Mr. Collins to act as temporary secretary.

Mr. Collins: I have the name of Mr. A. D. Meeker, of Marshalltown, Iowa, proposed for full membership in the association, with fee paid of $10.

Mr. Kruesi: I move that the secretary be instructed to cast a ballot for the election of Mr. Meeker to full membership.

(Motion seconded.)

The Chairman: It has been regularly moved and seconded that the secretary be instructed to cast a ballot for the election of Mr. Meeker to full membership.

(Motion was carried unanimously.)

Mr. Collins: Mr. President, I cast such a ballot.

The Chairman: We have a paper here from A. F. Jenkins, of the Alexander Milburn Company, of Baltimore, on "Some Industrial Uses and Possibilities of Acetylene." I will ask Mr. Collins to be good enough to read this paper.

(Reading of Mr. Jenkins' paper.)

SOME INDUSTRIAL USES AND POSSIBILITIES OF ACETYLENE.

A. F. JENKINS.

The old adage "Practice makes perfect," is nowhere more applicable than to the development of Acetylene. When first discovered we can imagine, that whilst it obviously produced a flame, for a while it probably seemed doubtful if it would ever be of practical service, as if burnt in any of the burners then in use it would have been hopelessly unsuitable, owing to its excessive richness and the amount of smoke it must have produced in the relatively large orifice of the coal gas burner.

We are, however, learning more and more to practically realize what has been considered as a philosophic principle, that all forces and elements are potentially good, or can be practically utilized. Such is the case with Acetylene—the richest of all gases in carbon, which seemed to be useful when burnt only in fine apertures and perfect air mixing burners, but which can now be burnt, provided there is suitable pressure, through burners or orifices of an exceptionally large size, and consequently give service in new directions.

By means of this accomplishment Acetylene is adapted for powerful out-of-door lights, of a portable form for contractors, railroad construction, break-down and emergency night work, and makes it the most ideal light known up to the present time.

A water to carbide generator is preferable for this class of work, as it is free from mechanism, smaller in size and more portable than carbide to water machines.

A suitably constructed apparatus possesses for the contractor the advantage of incomparable simplicity, in comparison to other lights with which he has been familiar. It possesses no pumps, gauges, valves or moving parts, and requires no attention during use, the mere weight of a suitable column of water performing all the work formerly done by a man, frequently pumping air and oil into his tank.

The acetylene light for this work merely requires the cock to be turned on and the match applied to the burner, when it is in full operation. Any of the oil lights heretofore used require to have the burner heated and the oil vaporized before they could start work. This, in wet or cold weather, is sometimes a difficult and tedious operation, and a storm or a quantity of water will immediately cool the burner and extinguish the light. With acetylene and the burner protected by a parabolic reflector, the flame defies wind and water—in fact, water may be thrown over a high pressure flame in bucketfuls without any other effect than to enhance its value by cooling the burner.

With a burner consisting of a round hole, the fifty-fifth of an inch and consuming, say, ten cubic feet of gas per hour, a flame 3x10 inches long, giving a bare light of 2,000 candlepower and a wide reflected light of 5,000 candlepower can be obtained, which will light up the contractor's work for a distance of over 1,000 feet and be useful to him at a distance of 1,500 feet. This obviously will provide sufficient light for a large gang of men working in an excavation or railroad cut. Oil lights of suitable capacity, without mantles, cannot be used with reflectors, and therefore have not this value for large area lighting. Without a reflector and two of the burners mentioned, the acetylene flame will produce equally as much light as the large oil burner consuming several gallons of oil per hour.

The cost of operating this class of acetylene light is incomparably lower than that of oil. A 5,000 candlepower light working for eight and one-half hours, for instance, will not exceed 50 cents. We have been in-formed by reliable users of the high pressure oil lights that an oil light will sometimes cost that much an hour, especially when the attention it requires is taken into consideration and the cost of renewal for burners, those for oil lights varying from $10 to $25 each, whereas that for this class of acetylene light does not exceed 25 and 50 cents.

The portability of an acetylene light is one of its strong features. A typical light measuring 12 inches square by 36 inches high, weighing only 80 pounds, will give 5,000 candlepower per hour. An oil light of the same capacity weighs more than double this.

Furthermore, as the parts of the acetylene generator usually telescope one in the other, this weight can be divided among several boys and the whole apparatus be easily transported some distance, an important feature in emergency work, such, for instance, as the life saving service or wrecking work. Whereas the typical oil lights are not made in sections, the apparatus must be carted away.

The perfect combustion of acetylene burnt in the unusually large burner employed in this class of acetylene light is owing to the fact that the velocity of the gas draws in a quantity of air commensurate with its consumption. Indeed, there is no reasonable limit to the size of the burner that can be used, provided the pressure of the gas can be proportionately increased.

Considering for a moment the number of railroads, the rapid growth of our cities and the vast amount of construction work going on all the time, there is unquestionably a large field for this class of apparatus.

For such out-of-door work as railroad wrecking work, steam shoveling and dredging, this class of light is particularly advantageous, because instead of vibration being detrimental, it aids the action of generation, and the ease with which the light can be piped in any direction makes it ideal in this service.

The use of acetylene in mines, tunnels and sewers has already been well demonstrated and proves to be a cheaper substitute than the installing of an electric system and the unlimited use of candle and oil lights. The quality of the acetylene flame in this respect is well adapted, as it is smokeless, and when the generator itself is placed above ground the service proves to be unquestionably safe to the most skeptical, and it is found that the gas is not easily extinguished, it burns more readily in bad air than any other open flame, and still consumes less air to vitiate the atmosphere.

We cannot close this subject without mentioning the utility of non-rechargeable acetylene torches and marine lights.

These are made in cylindrical form and give from 500 to 2,000 candlepower, and are largely used among railways, contractors, steamship owners, etc., for emergency work only. These possess the advantage of lasting indefinitely until used and being always ready for emergencies, like household fire extinguishers. On railroads they are distributed at different points and in case of need are unsealed and placed into a bucket or receptacle of water, in which they float until burnt out.

Among the South American railways in particular these have been in considerable demand. They are, of course, expensive for continual use, but for emergencies are probably the cheapest and most useful lights which can be found. The same class of light ignited on contact with water by calcium of phosphide forms the buoy light now exclusively used for marine purposes.

The practical utility of a single orifice passing ten to twenty cubic feet of acetylene gas an hour with perfect combustion opens up for acetylene gas new fields and possibilities, and properly aerified acetylene may be used for powerful heating, as well as lighting, or for other industrial purposes than oxy-acetylene welding, and perhaps mixed with another suitable element in place of liquid fuel.

The Chairman: Is there any discussion on this paper? If not, we would like to hear from Mr. Davis on the "History and Present Status of the Oxy-Acetylene Blowpipe in America."

THE HISTORY AND PRESENT STATUS OF THE OXY-ACETYLENE PROCESS IN AMERICA.

By Augustine Davis.

In the latter part of 1903 or early in 1904 Edmond Fouche, of Paris, France, began experimenting with the oxy-acetylene torch. While conducting these experiments, he wrote Eugene Bournonville, of New York, concerning the same and in February, 1904, he sent two of his torches to Mr. Bournonville, who repaired a broken machine which is still in operation and performed other work. The largest torch made at that time was 500 litres capacity, or about 18 cubic feet of acetylene.

These first experiments were made with dissolved or compressed acetylene. As this acetylene was controlled by the French company, Acetylene Dissous, of which Mr. Fouche wished to be independent, he united with E. A. Javal, of Paris, in the production of what is known as the low pressure torch. This torch could be used with acetylene from the ordinary low pressure acetylene lighting generator, but was so intricate that it could not be repaired without return to the manufacturer.

As the high pressure Fouche torch had serious defects, and the low pressure torch was not entirely satisfactory, because it depended upon injection for its mixture of acetylene with oxygen, A. Boas, Rodrigues & Company, of Paris, undertook the production of a torch which would remedy both of these defects.

This company is the largest acetylene company in France and has a fine laboratory, yet it worked many months before accomplishing its object. It succeeded in producing a torch which would not only operate over the entire range of pressures suitable for the process, but was successful in arranging so that a number of tips of various capacities could be used in a single torch.

About the year 1906 the Industrial Oxygen Company, of New York, imported a French torch and also a compound known as "epurite," from which to generate oxygen. They also brought from France a Mr. Beltzer and

Mr. DelCampe, who were experienced workmen. They placed several of their plants in large industrial concerns, which are yet in use. The "epurite" compound for oxygen does not seem to have been successful, as the company is now advertising the "oxygenite process."

A little later Mr. Beltzer and Mr. DelCampe retired from this company, and went to Connecticut, where they are exploiting apparatus of their own design.

The Linde Air Products Company and the National Welding Company, both of Buffalo, have commenced the sale of apparatus within the past year.

It is also understood that Nelson Goodyear, long the engineer of the Colt Company, New York, is developing apparatus.

In July, 1906, the writer met Mr. Bournonville in Paris and with him made an extensive investigation of the process, resulting in an agreement to unite efforts for the introduction of the process in this country. They both went to Paris again in the spring of 1907, and conducted still further investigation, resulting in the acquirement of the control for America of A. Boas, Rodrigues & Company's torch, which Mr. Bournonville had been using for several months in the factory of the Acetylene Specialty Company at Jersey City.

On their return from Paris, the writer invented and had constructed a generator which generates acetylene up to fifteen pounds pressure, direct from carbide, and the same was submitted and passed the inspection of the engineers for the National Board of Fire Underwriters.

It was soon discovered that no adequate supply of oxygen could be secured for use in the process. Previous to that time oxygen had been manufactured almost exclusively for medicinal purposes, and was being sold at from 10 to 20 cents per cubic foot. A small supply was obtained temporarily, as a personal favor, at 5 cents per cubic foot, but even this supply soon failed and it became apparent that the industry could make little progress until oxygen could be produced in greater quantity and at lower prices.

An arrangement was made by the Davis-Bournonville

Company to introduce a secret barium process, from France, but owing to the cupidity of the inventor, this was later found to be impossible. It was finally determined to use the chlorate of potash process, from which practically all of the oxygen then being made in this country was obtained, but the apparatus for this purpose was found to be so crude and unsatisfactory that entirely new apparatus had to be designed and built.

In 1906, Mr. Linde, the promotor of the liquid air process in Germany, came into this country with Cecil Lightfoot, and after long negotiation finally decided to build a liquid air plant for the production of oxygen, at Buffalo. An extensive plant was constructed and began operation in the fall of 1907, delivering oxygen in tanks at about 1,800 pounds pressure.

About this same period, F. W. Clifford, a chemist of wide experience in oxygen production, began the manufacture of oxygen by an electrical process at Suspension Bridge, New York. He organized the United Oxygen & Chemical Company, which is now erecting a new building, and greatly increasing the capacity of the plant.

For about two years past, J. F. Place, of Glen Ridge, N. J., and John A. Inslee, of New York, have been developing a liquid air process, which is now in operation under the name of the New England Refrigerating Company, at Norwich, Conn. While this company has not yet placed oxygen on the market, it claims to have developen its apparatus to a very successful working condition, and within a short time it will be able to offer oxygen at a very moderate price, in large quantities.

The S. S. White Dental Manufacturing Company, of Prince's Bay, Staten Island, is also making oxygen in considerable quantities, by a secret process.

In addition to the plants named, there are a number of attempts to produce oxygen by individual plants, which promise, with development, to become more or less satisfactory so that the most serious obstacle to the progress of the industry, will, in all probability, soon be removed.

The writer's knowledge of the development of the art

APROXIMATE COST OF OXY-ACETYLENE WELDING.

Oxygen at three cents – Acetylene at one cent per cubic foot. Labor 30 cents per hour.

Tip Number	Thickness of Metal	Consumption of Acetylene Per Hour	Consumption of Oxygen Per Hour	Proper Pressure in Pounds for Oxygen	Lineal Feet Welded Per Hour	Cost of Labor Per Hour	Total Cost Per Hour	Cost Per Lineal Foot
1	1/32 to 1/16	2.8 feet	3.6 feet	8 to 10 lbs.	50 feet	.30 cents	.436	.0087
2	1/16 to 3/32	4.5 "	5.7 "	10 to 12 "	30 "	.30 cents	.516	.0172
3	3/32 to 1/8	7.5 "	9.7 "	12 to 14 "	25 "	.30 "	.666	.0266
4	1/8 to 1/4	11.7 "	15. "	14 to 18 "	16 "	.30 "	.867	.054
5	1/4 to 5/16	18. "	23. "	18 to 22 "	10 "	.30 "	1.17	.117
6	5/16 to 7/16	25. "	32. "	20 to 25 "	7 "	.30 "	1.51	.216
7	7/16 to 1/2	32.5 "	41.5 "	22 to 27 "	5 "	.30 "	1.87	.374
8	1/2 upward	48.5 "	62. "	24 to 30 "			2.64	

OPROXIMATE COST OF CUTTING STEEL.

Number Cutting Tip	Use Welding Tip No.	Thickness of Steel	Heating Jet. Feet of Acetylene	Heating Jet. Feet of Oxygen	Cutting Jet. Feet of Oxygen	Pressure of Oxygen Heating Jet	Pressure of Oxygen Cutting Jet	Lineal Feet Cut Per Hour	Labor Per Hour	Total Cost Per Hour	Cost Per Lineal Foot
1	4	up to ½"	12	15½	60	14 to 18 lbs.	125 lbs.	60	.30	2.68	.0447
2	4	½" to 1½"	12	15½	75	14 to 18 "	125 to 150	50	.30	3.13	.0627
3	5	1½" up	18	23	75	18 to 22 "	150 to 175	40	.30	4.02	.1005

is confined largely to his experience with the Davis-Bournonville Company, and it will therefore be necessary for him to frequently refer to this company if he is to impart the information obtained by such experience.

The following is an extract from a new catalog for the company which is now in press:

AUTOGENOUS WELDING.

"Autogenous welding is uniting metals by heat, without either flux or compression.

"While this object has been obtained, to some extent, by the use of oxy-gas and oxy-hydrogen, it is only very recently that a really satisfactory method has been developed through the oxy-acetylene process.

"It is obvious that very high temperature, full control, and facility of application are necessary requisites for great efficiency.

TEMPERATURES.

"The highest temperature of the best solid fuel furnaces is about 3,000 F.

"The oxy-hydrogen, which was the hottest of the gas flames, is something less than 4,000 F.

"The oxy-acetylene flame jumps this temperature more than 2,000 F., to about 6,300 F., being more than double the hottest solid fuel heat known.

"As acetylene produces about five times more heat per cubic foot than hydrogen, and nearly doubles it in intensity, a marvelously powerful flame is condensed into very small volume. Compared to the oxy-hydrogen flame, it is like a finely pointed tool to a blunt instrument.

"With such a tool, having heating power from two to three times that required to melt the commercial metals, almost incredible results are obtained.

USES OF PROCESS.

"By this process, iron, steel, cast iron, aluminum, brass, copper and other metals can be so perfectly united that, when smooth, the joint cannot be discerned.

"Containers for fluids and liquids can be made without joints and will not leak when bruised or dented, as will riveted vessels.

"Blow-holes and other defects in iron, steel, brass and other castings can be repaired, not only saving the castings but, many times, expensive machine work as well.

"Quickly repairing broken machines, boilers and steam and other piping, in place, is one of the most valuable features of this process, not only saving the articles themselves, but what is often of vastly more importance, preventing long and expensive suspension of operations while repairs are being made.

Worn parts of machinery and teeth on gear wheels can be built up, tool steel added to common steel, dies repaired, and numberless other operations accomplished which are not possible by other methods.

"The repair of aluminum automobile casings and cast-iron cylinders is a large business in itself.

RAIL BONDING.

"Not only metals of the same kind, but those of different kinds, can be perfectly united. The company has been awarded two patents for bonding rails with copper bonds, it being easily possible to unite the metals perfectly, giving any desired area of contact.

CUTTING STEEL AND IRON.

"The facility with which steel and iron (except cast iron) can be cut is really marvelous. The operation is performed by heating the metal, at the first point of contact, to the red, by the ordinary welding flame, and with this flame continued a jet of pure oxygen is turned on, which unites with the carbon of the metal and disintegrates it with surprising rapidity. The cut is narrow and smooth, with no material injury by oxidation. The cut can be made in any shape and the process will be found very useful in cutting irregular forms, and will be valuable especially in making many kinds of dies and in fitting steel plates. It is very effective for cutting steel beams in structural work."

The industry is passing through almost identically the same conditions which were experienced by the acetylene generator industry in its earlier history. It will be remembered by the members of this association that the construction of an acetylene generator was thought to be so simple that almost anyone could build a satisfactory machine. It has taken many years of strenuous effort and hundreds of thousands of dollars to remove this erroneous impression. It is not unlikely that even a more expensive experience and long continued effort will be necessary to develop the oxy-acetylene process into the widely extended use which it is most certainly destined to occupy.

Not only must there be an unlimited supply of oxygen and acetylene and highly perfected apparatus, but there must also be the intelligent, resourceful operator behind the torch, to make the process a success. Already there are manufacturers who have purchased inadequate apparatus because it was cheap, or good apparatus without being properly instructed in its use, and who are condemning the process because of this faulty apparatus or of their ignorance of the art.

The promoters of the Davis-Bournonville Company, having been engaged in the acetylene industry since its inception, are attempting to avoid the disastrous experiences of the generator business by perfecting in every detail their apparatus before placing it on the market.

This company has been doing a great variety of repairs at its temporary factory at Jersey City for the past year, and is now constructing a commodious new factory, with the purpose of not only developing their apparatus to its fullest extent, by practical every-day work, but more particularly to afford facilities for thoroughly instructing employees of its patrons in the use of the process.

The A. Boas, Rodrigues & Company torch, known here as the Davis-Bournonville, has been improved in design and construction until it is now practically perfect. All of the authorities have given 2.5 parts of oxygen to 1 of acetylene as the theoretical quantities required and 1.8 of oxygen to 1 of acetylene as the quantities actually used in practice. With their apparatus and torch, the Davis-Bournonville Company has succeeded in securing a perfect welding flame, with only 1.28 parts of oxygen to 1 of acetylene, not only effecting a very material saving in the cost of operation, but obtaining better results as well. An imperfect mixture of gases is not only much more expensive, but an excess of oxygen oxidizes the metal, and too much acetylene carburets it, either condition being seriously detrimental.

This company has already sold about twenty-five plants, most of them to very large industrial concerns, and the developments are very satisfactory.

Railway companies are particularly interested. At one of the large railway shops several repairs to locomotive boilers have been made, obviating the expensive removal of defective sheets. A locomotive frame 5x5½ inches was cut in two and one-half minutes. An extensive demonstration is being made at this time at this shop, the results of which are being awaited by several other railway companies with much interest.

Recently about twenty split boiler tubes were welded by this process, all of which were then burst by excessive pressure, by not one of them parted at the weld.

Some months since, J. G. Stevenson, of the Baltimore & Ohio Railway Company, made some tests and obtained 94 per cent of the original strength of cast steel and 88 per cent of rolled steel. The experience in operation since has undoubtedly improved this kind of work.

In the railway shops where these tests are being made thermit is successfully used in welding heavy locomotive frames, but it is believed that the oxy-acetylene process can be used to great advantage in preparing the frames for the operation and in cutting away the excess of very hard material afterwards. Recently about 70 feet of steel piling, running from ⅜ inch to 2¼ inches in thickness, and a number of steel beams were cut, in the construction of a building in New York. A 15-inch I beam was cut in four minutes. A boiler was also cut and removed from a steamship.

Cast iron, welded by this process, rarely breaks in the weld. Cast iron welded to steel breaks in the original cast iron instead of where joined to the steel.

The development of this process is scarcely begun, and its field is almost without limit, but, as previously stated, it is an art which will require intelligence, fertility, patience and experience to secure the marvelous results of which it is capable. Pure oxygen and acetylene and the best apparatus possible to produce are absolute requisites. Short cuts, cheap apparatus and incapable operators are certain to retard progress greatly. Where the process is to be used over and over on the same kind of work, a conscientious operator of very ordinary ability can within a few weeks become quite expert, but where a very large variety of work is to be performed, knowledge of metals, resourcefulness, personal interest and experience are indispensable.

A carefully prepared table, showing the approximate cost of cutting and welding, is appended hereto, and will be found of much interest to investigators.

Notwithstanding the serious obstacles to be overcome, the continuous interest manifested by the engineering department of many of the largest and most progressive industrial concerns in this country warrants the prediction that within a very brief time the oxy-acetylene process will become one of the most important factors in the progress of the metal working industry.

The Chairman: Gentlemen, I am glad to say that we have with us again this year Professor Pond, of the State College of Pennsylvania, who will give us a paper on "Calcium Carbide in New Fields."

Professor Pond: Mr. President and gentlemen, two or three weeks ago I received a letter from your amiable secretary, saying that he had placed my name upon the program for this meeting. I was very glad of that. It is all right as far as it goes, but he went on to say that he had also assigned a subject to me, and when I discovered what the subject was I realized that it was the very subject on which he himself had prepared a paper the previous year and exhausted the subject for the present, past and future. It required a good deal of nerve to assign that subject to me. However, that is one of the qualities which make up an efficient secretary. I presume that I will be permitted to use this title somewhat as a clergyman does his text, as a sort of springboard by which to vault as far from the subject as possible. So I have concluded to give you a very brief paper, more or less connected with the subject.

ACETYLENE IN NEW FIELDS.

PROFESSOR G. G. POND.

I am convinced that it is not in ways new in principle, not in any obscure and hitherto unknown fields, that acetylene will find its chief coming successes, win its future laurels.

On the contrary, it will be by developing the same old lines which we all know about and which are everywhere familiar, though, of course, they will be developed in some directions in accord with marvelous applications not now dreamed of.

We may confidently expect, therefore, that acetylene will find its application in the next decade in connection with these three important branches of the industry: Light, heat and power.

In the first of these subdivisions, light, acetylene has made up to now its greatest advances. But we must look for far greater inroads upon the territory now occupied by our opponents. Electricity and acetylene are the only forms of light that are on the increase today. All the others, oil, gas and candles, are either stationary or diminishing in quantity employed. Should we not look for a steady and sure development of acetylene lighting until oil lighting shall be as much a thing of the past as candle lighting is at the present day?

And here let me say that I still believe that it is in the smaller installations, in the country, in small towns and in isolated buildings that acetylene will ever maintain the ascendancy which is sure to come. Acetylene is the most beautiful of lights, the whitest, and the one which causes least fatigue to the eye, because it most closely approaches the solar light. Therefore it is bound to be true that, when other conditions do not control, acetylene is sure to win out. In the larger towns, where light is to be had by turning a valve or pressing a button, acetylene will find some application, but will not ultimately prevail. But in small towns and villages, in country homes, bungalows, summer cottages, in factories, shops, stores, railroad stations, schools, sanitariums, in hotels and cafés and casinos, in lighthouses and, in fact, under all sorts of conditions where electric light and coal gas are impracticable, beautiful acetylene is the best, the most popular, the cheapest form of light.

Nor should we forget here that acetylene will find great and increasing use for automobiles, omnibuses, carriages and street cars, for locomotives and railway coaches, for headlights of all descriptions, for miners' lamps, for signals and buoys, and a hundred other applications which classify as portable rather than stationary uses, and whose number is constantly and rapidly increasing.

ACETYLENE AS A HEATING AGENT.

But acetylene is not only a marvelous light; it also possesses an adaptability as a heating agent, the limitations of which have by no means been attained, and its use as a source of heat will, in my opinion, contribute largely to the development of the industry.

We are wont to refer, in our praise of acetylene, to the low temperature of the flame. To some minds it seems to be a contradiction to turn about and make large ado about the high heat produced by its combustion. But this is all right, and there is no real contradiction. The actual temperature of a point in a flame is one thing and the total heat produced by the combustion of a given quantity of fuel is quite a different matter. It is possible for a gas to possess, and acetylene is fortunate in that it does possess, the advantageous combination of low flame temperature and high total heat production.

In the one case we burn with the yellow flame to produce all the light we can; in the other case we regulate so as to burn with the blue flame to produce all the heat we can. This blue flame, you know it if you cook with acetylene, possesses great possibilities not as yet extensively developed. Cooking with acetylene is coming into a larger use month by month. It should become universal wherever acetylene light is employed. The intensity of acetylene heat, three or four times that of coal gas, should and will strongly recommend it.

Acetylene, by reason of its concentrated character, gives up its heat just where it is wanted in burners of the cooker type and it is well worth consideration, on the part of any housewife who has acetylene at hand for illumination, whether she could not advantageously substitute an acetylene cooking stove for the primitive and almost obsolete coal and wood fire.

I have an impression also that if those who are interested in the business side of this particular branch of the industry would develop and make use of the article known as the "Fireless Cooker," a considerable advance in cooking by acetylene might be made.

While the cooking burners have reached a high stage of perfection, bunsen burners, so far as I can learn, still lag behind. Bunsen burners are utilized in shops of various sorts, by jewelers and others who require a quick and ready heat, and in physical, mechanical, electrical and chemical laboratories. I eagerly look for the day when a really perfect bunsen for acetylene will be brought out.

Right here should be mentioned that wonderfully simple yet powerfully efficient agent, the oxy-acetylene blowpipe, an instrument which has already arrived at a degree of usefulness which is astounding and which is really as yet only in its earliest infancy.

I believe that this application of acetylene is destined in a few years' time to experience a growth and development which its most enthusiastic promoters are just beginning to think about.

We shall learn from experts of the present state of this industry at this convention, and I will leave it to you to judge what varieties of application and marvels of universal adaptability illumine its already bright future. Difficulties there are to be sure. What industry is without them? Yet American acetylenists are facing these, and acetylene welding will show us much that is wonderful in the near future.

ACETYLENE AS A MOTOR AGENT.

The third grand subdivision in the use of acetylene is its application for motor power.

Ever since the commercial possibility of acetylene as a practical industry began, it has been well known that there is a latent power in its combustion which needs only to be harnessed to become extremely useful. In fact, a gas engine adapted to acetylene ought to so greatly surpass in excellence all those which are used for coal gas and gasoline as to drive the latter entirely out of the market.

To our surprise, another year has rolled by and the perfect acetylene motor is as far off in the dim future as ever.

But it is bound to come!

Whether those who have experimented in this field have not possessed a sound scientific conception of the problem which was before them and an ability to correctly interpret their results I know not, but it is a problem which must and will be solved.

Among the difficulties in the construction of the perfect acetylene motor are:

(1) Delivery of the correct homogeneous mixture of acetylene and air at the point of explosion.

(2) Economical utilization of the force of the explosion.

(3) Prompt removal of the carbon deposit which fouls the explosion-chamber as a result of imperfect combustion.

But when these shall be finally overcome and a successful acetylene motor is ultimately produced, then I predict for acetylene as a motor force a no less brilliant career than for the lighting and heating sides of our industry.

The Chairman: Gentlemen, we have with us at this meeting Professor Mertes, of Notre Dame University. We will be glad to hear from Professor Mertes now on the "Prevention of Frost in Acetylene Generators."

ANTI-FREEZING MIXTURES FOR GENERATORS—ABSOLUTE ALCOHOL—TETRACHLORIDE.

Albert T. Mertes.

The freezing of acetylene generators during cold weather has been the source of much trouble and annoyance. A method that could be used having the advantage of being both cheap and convenient is a chemical one which utilizes the lowering of the freezing point of a solution of a salt in water.

If a solution of common salt be taken instead of the ordinary water commonly used, it will require a greater degree of cold to freeze the generator tank. A 15 per cent solution of common salt freezes at about 12 degrees Fahrenheit, and such a solution contains 1.3 pounds of salt dissolved in a gallon of water. A 20 per cent solution, containing 1.7 pounds per gallon, freezes at about 7 degrees F., and a 25 per cent solution with 2.1 pounds per gallon dissolved requires a temperature of about 0 degrees to freeze it.

A generator tank having a capacity of 100 gallons of water would take about 170 pounds of salt to bring the freezing temperature to 7 degrees F., and with salt at a cost of one-third cent per pound, it would amount to 57 cents to charge the solution. This salting of the generator need not be done in other than cold weather and the salt, of course, would need to be replaced each time the generator water is changed.

In sections of the country where the temperature falls very low during the winter a calcium chloride solution should be used instead of common salt, and even in spite of its greater cost it would be better to use because of its having less corrosive action on the generator tank.

A 15 per cent solution of calcium chloride containing 1.8 pounds of the commercial fused salt of 75 per cent purity, dissolved in a gallon of water freezes at a temperature of about 12 degrees F., while a 20 per cent solution with 2.3 pounds dissolved freezes at —1.5 degrees F., and 25 and 30 per cent solutions freeze at —22 degrees and —54.4 degrees, respectively.

For the best practical purposes a 20 per cent calcium chloride solution would be sufficient in a locality where the temperature seldom falls below zero.

The cost of charging a 100-gallon generator tank with such a solution, using commercial calcium chloride at a cost of 2½ cents per pound, would be about $5.35.

The salt in the water of the generator tank has the effect of decreasing the rapidity of the action of the carbide on the water, but will in no way interfere with the yield of the gas.

A solution stronger than 25 per cent calcium chloride or with a specific gravity of more than 1.20 would not be advisable to use, as it would slow up the action of the carbide on the water too greatly.

A way of obtaining a calcium chloride solution cheaper than the above method would be to dissolve in hydrochloric acid the residue of slaked lime remaining in the tank. To obtain a 20 per cent solution in a hundred gallons of water it would be necessary to dissolve the residue produced by the action of 100 pounds of carbide on water in about 300 pounds of muriatic acid, care being taken that an excess of acid is not present, or else it will attack the tank walls. This dissolving can be best accomplished in a barrel and the strength of the solution tested with a hydrometer. A 20 per cent solution has a specific gravity of 1.18 and reads 22 degrees on the Baume hydrometer scale. With muriatic acid costing $1.50 per carboy, it will amount to about $4.25 by this method of charging the generator water with calcium chloride, and mean a saving of $1 over the above process.

With a generator placed in a warmly constructed building or outhouse and using a salt solution, there would be little danger whatever of the liquid freezing even in weather below zero.

The great affinity that calcium carbide has for water may be utilized in the preparation of alcohol by dehydrating the commercial variety.

Absolute alcohol has many applications in the field of chemistry, being much used for the preparation of dyes, and in biology for the preservation of specimens, and, for the making of microscopic mounts, it is invaluable and has no substitute. It is ordinarily prepared by repeated dehydration of commercial alcohol with calcium oxide, the water being absorbed or combined with the quicklime making slaked lime.

This process is a very tedious one on account of the great difficulty with which the last traces of water are removed, and since the yield is not very large the pure absolute product is very expensive.

If calcium carbide be used instead of quicklime it has not only the advantage of being in good form to act on the water contained in the alcohol, but is twice as efficient because two molecules of water are required to produce one molecule of acetylene and one of calcium hydroxide or quicklime.

Since less dehydrating material has to be used the reaction will be completed in shorter time and there will be less residue of slaked lime remaining from which the alcohol must be distilled, therefore a greater yield may be expected.

In a laboratory experiment using about two liters of 95 per cent ethyl alcohol and about one pound calcium carbide, I succeeded in obtaining a yield of the absolute produce equivalent to over 80 per cent and at an extremely low cost.

Manufacturing absolute alcohol on a large scale by the carbide method can be done so cheaply that the old process would soon be discontinued and the carbide method supersede it.

A very valuable use to which acetylene can be put commercially is the preparation of acetylene tetrachloride or tetrachlorethane. This substance is a perfect substitute for carbon tetrachloride, so much used in the wool cleaning industry for the purpose of dissolving out the animal fats from the wool.

On account of the great danger of fire the solvent used must be non-inflammable and for this reason carbontetrachloride has been used, and, as it is a very expensive substance, a good cheap substitute would be much welcomed by the wool cleaners.

By a process discovered by Dr. Nieuwland it is possible to chlorinate acetylene directly by passing the two gases in the right proportions over antimony trichloride, which acts as a catylitic agent and causes the direct union of the chlorine and acetylene molecules without itself being changed, so the process is a continuous one and uses up only the acetylene and chlorine. The acetylene tetrachloride in a very pure condition is distilled off into a receiver as fast as formed.

Since acetylene and chlorine can be produced very cheaply there is no doubt but what tetrachloretane can be manufactured at so low a cost as to displace carbontetrachloride from the wool cleaning industry.

The Chairman: We will now have a paper by Mr. Morrison.

Mr. Morrison: This paper, I believe, takes up rather a new subject, although we have all covered the ground in some direction, and is written with the idea that it may attract attention of physicians to the use of acetylene, which might lead to the introduction of acetylene in country physicians' homes, in the offices of the physicians throughout the world, and perhaps in hospitals, etc.

DIAGNOSIS UNDER ARTIFICIAL LIGHT: ITS DIFFICULTIES AND A SOLUTION OF THE PROBLEM.

A. CRESSY MORRISON.

Most physicians recognize the difficulty of accurately judging the condition of tissues by means of artificial illuminants. The difficulty has, however, usually been accepted as inevitable. Until recently no artificial illuminant has been known which has the balanced spectrum of sunlight, and so, where diagnosis has been necessary by means of artificial illuminants, the physician has done the best he could, occasionally correcting his opinion after a verification of the examination by daylight.

The eye, through all ages, has adapted itself to see by daylight. Its evolution has been wrought in harmony with the solar spectrum. The seven colors of the solar spectrum have a given intensity; combined, they make white light. All artificial illuminants, save acetylene alone, have an excess of one color or another. City gas light has an excess of red, kerosene an excess of yellow and red, the Welsbach burner an excess of green, the arc light an excess of violet, the incandescent an excess of orange and red. Acetylene, on the other hand, has the seven colors in such intensity that, compared with sunlight, the difference is negligible. The excess of one color or another in artificial illuminants upsets the judgment of the physician, and is bound to have an effect upon the validity of a diagnosis. If the eye has adjusted itself to see best by daylight, then, under daylight, colors have their normal values, and the mind, trained and adjusted to base its conclusions upon what the eye reports, can only with the greatest difficulty make the proper additions and deductions that an accurate conclusion may be reached. How can the mind say to the eye, which reports accurately what it sees, "You are deceived. The light by which you see that tissue is a distorted light. Therefore the color you report is not the real color of the object as seen by daylight. It is not so red as you say it is. Therefore the inflammation is not so bad; therefore the case is not so serious"?

We seldom think of it, but there is literally no color. The blue sky is not blue, but light makes it appear so. Light, falling upon particles of matter, is diffused, but space, where there is no matter which will hold light, is absolutely black. The silver moon is matter, and this matter reflects the light of the sun to us. Therefore the moon is visible. The green grass reflects to our eye the green rays which come to it from the sun. Speaking broadly, if it could not reflect the green rays and could not reflect any other, the grass would be black. Color, therefore, does not exist except as the waves of light are thrown back into the eye from the object upon which we look. Waves of a certain length have a certain color. The slowest rays are red, and the quickest visible rays are violet. If an object absorbs and neutralizes all the rays or waves except the very long ones, and these are thrown back to us, we say the object is red. All light and color and every wave has ceased but red. The application of this to diagnosis must be immediately apparent. If a tissue is examined under city gas light, in which the spectrum shows that there is a large excess of red rays, then a tissue which in daylight would be normal would, under gas light, appear to be much redder than it really is. The eye accurately reports the excess of red color, and as inflammation increases the ability of a tissue to reflect red rays, the mind instantly says the tissue is inflamed, while, as a matter of fact, it is not the tissue which is inflamed, but, to put it in a curious way, it is the light which is inflamed. It has an excess of red. If a physician is examining tissues under a green light, the tissues have an abnormal and ghastly appearance. Green light, if thrown upon a red surface in sufficient quantity, leaves the red without light; therefore the red appears black. If green rays fall upon a surface which in daylight would be red, the surface cannot respond; therefore it has no color, and, in the absence of color, it is black.

It is unnecessary to go further in this line of thought, as physicians are already fully aware of the difficulties of proper diagnosis with artificial light. There are, however, some phases of the subject which are not always given consideration. In the case of an examination of the blood to discover an anæmic condition, it should be remembered that, if examination under artificial illuminants is made, with an illuminant giving an excess of red, the condition of the blood appears much better than it really is, and under an illuminant which is deficient in red, the apparent condition of the blood is much worse than it really is.

So important is accurate judgment to the physician and the surgeon that the adoption of acetylene, which is really daylight at night, in the operating rooms of hospitals is almost a necessity. The spectral similarity between acetylene and sunlight has only been recently brought to the attention of physicians, and its advantages were immediately recognized.

The ordinary portable lights, like a house lamp, with a suitable reflector, have been adopted and brought into use by physicians who have seen the necessity of acetylene. As a matter of fact, small acetylene lamps of a portable character are in use in fifty-four out of the sixty public hospitals in New York City. The most eminent physicians connected with these hospitals have spoken of the value of acetylene in the highest terms. The investigation of the matter went no further than New York City, but the large proportion of hospitals in which acetylene is appreciated and in constant use was a surprise to the writer. These minor units do not meet the full requirements of the case. They are convenient because they are movable, and as an accessory to the system of hospital lighting have been proved valuable. There should, however, be in every hospital operating room a complete system of acetylene illumination; proper reflectors should be provided, and whether the source of acetylene should be the modern house generator or cylinders, which are now used so extensively in railroad illumination, is a question which should be decided by local conditions. A perfect light for emergency operations at night is a desideratum of primary importance, and there should be no hesitation in working out a plan by which the hospital operating room should be given this nearest approach to daylight at night.

Acetylene is within the reach of every physician, and especially those in the country, as an individual household generator is now made by manufacturers in almost every city, which will produce acetylene for lighting an entire house, at a cost, candle power for candle power, which compares favorably with city gas at a dollar per thousand cubic feet. The apparatus and piping are not expensive, and can be put into any house without disturbing furniture of walls by a good plumber in two or three days. Over 150,000 individual installations are now located in country homes throughout the United States, so that its safety and utility are completely demonstrated. Many physicians have adopted acetylene as the common illuminant for their homes, and find it of inestimable value in their practice, and of great benefit to their patients.

Acetylene illumination is already recognized of immense value by dye houses, lithographers, artists and others who require an illuminant which will give them the ability to discriminate closely between different shades and colors, and men of the profession will not be slow to add to their equipment so simple an improvement.

The Chairman: We will now be glad to hear from Mr. Wilson.

Mr. Wilson: For about ten years the American people, anyway, and perhaps many others, have been obtaining from the people in the acetylene business much more than they have paid for. That may sound queer, but it is a fact. The reason behind that is simple enough. People in the acetylene business, while they all knew it, have failed to recognize the fact that in every concern, if it is going to be successful, cost is the basic element. Too many people do not realize what the elements of cost are. The average man very carefully keeps track of the material that goes into his product, and if he is real careful he keeps track of the time that goes into his product, and if he is unusually careful he keeps books, and when he gets to the end of the year he figures up, and if he finds that he makes good money, he kicks about the low prices of the other fellow. I think this is going on all over this country, not only in the acetylene business but in other lines of business. Strange it goes on year after year. There is no excuse for it in the acetylene industry, because it is too compact. There are not enough people in it so that that condition should prevail. All that it requires is a little bit of innate honesty with oneself to eliminate that condition. If the people in this industry will get down to business and will honestly face conditions as they are, it will not be necessary at any stage of this industry to fret about any price agreement, or anything else. It will be automatic, not because anybody realizes that he is selling goods below cost, but the only trouble is that they don't realize it. They continually fool themselves. I do not know of any man who is quite so dangerous from the standpoint of honesty as the man who will deliberately play solitaire and cheat, and that is what the bunch are doing. All the dangers that civilization faces can be summed right up into two general classes—their ignorance and fears. If we could overcome those two elements in the make-up of humanity, this would be a fine world to live in for everybody. A whole lot of people are ignorant about the how of doing this thing, and a whole lot of others are afraid to come out and face the situation as it is, and some of them are both.

The first step in the remedy of this situation is for the people who keep books (the others won't last long) to analyze their accounts, find out where their money goes, not in a bunch, but in specific directions, figure these amounts out in percentages upon their product, and find out what they must get for the individual things in order to have something left at the end of the year—besides a headache.

To get down to something concrete, we can take (this is simply a generalization) about ten dollars' worth of material of one kind and another and twenty dollars' worth of labor of more or less intelligence and efficiency. By combining those, under proper management, we can produce an acetylene generator. Never mind what size it is. Now, it seems like a simple thing to say what that acetylene generator is going to cost, but it isn't—at least when I see the range of prices that people apply to those things which represent ten dollars' worth of material and twenty dollars' worth of labor, we have some minimum figures which I believe apply in the building of acetylene generators. I am speaking now of a very fair product, under conditions which are reasonably economical, and in the hands of men who have not only general business training, but who know something about this specific business. If you add 10 per cent to that material, you will probably, at the time it goes into the job, arrive somewhere near what it has cost. If you run your shop very, very close and add 60 per cent to the labor, if you are lucky and have really good foremen and employ men enough, have low enough rent, etc., that is about what your labor will cost. That means that your ten dollars' worth of stock is eleven dollars, that your twenty dollars' worth of labor is thirty-two dollars, and the whole thing together makes forty-three dollars. You have still got it on the back walk, and there it is not worth anything. You build it to turn into money, and it won't turn into money by itself. There must be some administration in that institution, whether big or little; I don't care whether you allow yourself a salary or not. I do not believe that anyone in the acetylene business can do it for less than 33 per cent of these figures I have named. That puts it up to fifty-nine dollars. You still have the thing on the back walk. It is there and it does not contribute anything to your bank account. The longer you keep it, the more it will cost, because you have all kinds of expenditures going on continuously; you have to sell it, you have to install it, and do some more things. I venture to say that anyone who will keenly analyze his books up to the time this thing has begun to work will find that he has to pay about 100 per cent on that, which puts this thing at about one hundred and eighteen dollars. Now, then, you can include a whole lot of other things that come along with it, if you will sit down all by yourself and figure the thing out. But I know people who think they are making money, who will take just exactly these elements that I have mentioned and try to stay in the game and try to make progress by selling that thing for about fifty to sixty dollars—and then kick. Now, this may sound high to you; it probably does to everybody in this room; but I only ask you to just sit down and compare it with your own experience. We are in a business with tremendous overhead charges, a business that is going to have tremendous overhead charges for years. We are not simply selling pipe, fittings, galvanized iron, rivets and mechanics' time —not at all; we are adding to that some service. At least we think we are in this business legitimately, and if we are not in the business legitimately we cannot stay. We must get something for that service. It is strange, but it is as old as history, that people will pay more for service than for things. In this country you find a considerable number of small towns complaining of the mail-order proposition. You will also find there the merchant who is simply selling things. He has not added service to the things he sells. Right here is, to my mind, the essence of this whole problem, for the people in the acetylene industry to dignify themselves and to dignify their occupation, and to render service and demand pay for service. The man who sits down and begins to sell silver dollar pieces or five-dollar gold pieces at par is bound to lose. People will pass some bad money on him in exchange, and every once in a while a piece will slip off and roll under the table. That is the trouble in this acetylene business. I do not believe you can put up the price after you have established a low scale, unless you take the bit in your teeth and go right after it. The people in the business, I think, are beginning to realize exactly what I am trying to state. I know that some of them do not realize it, and, until they do, it makes trouble for all of the rest, and the individuals fail to realize that they are not doing themselves or anybody else any good.

I am very glad to say that some years ago we spent money in the attempt to educate the public. Educating the public is high priced business, and we saw that our money would not hold out if we stayed in the game. A lot of other things looked better to us than acetylene did just then, and we decided that we would not play with the house lighting business any more. We were satisfied that it was not so much of a trick, but we thought we would rather let somebody else do the educating of the public, and then maybe we would get back into the game.

I only hand you this merely as the observations of a rank outsider who was in the game, but, when the ante got too high, or, rather, when they began to get too much money on the table, he decided that he would drop out.

The Chairman: We are now ready for any new business.

Mr. Webb: I have spent a lifetime in the manufacturing business and in the acetylene business, but after all is said and done, the manufacturing business in almost any line is much the same when it comes to cost. I have no doubt but what our failure to expand is this one point, and I am going to ask you if it is to be supposed that capable business men, such as compose this association, go on conducting their business year after year without knowing what it costs to do it?

Mr. Wilson: Yes, sir.

Mr. Webb: I have been connected with the manufacturing business for a lifetime. I am surprised when a man makes that statement. I know exactly what things cost, as well as any human being can know them. Now, there is in every manufacturing business what we call a lapse. It takes a pretty smart man to figure this. In the question of labor you can get just so far, but if you simply take that which you say you do, you never have figured the labor. You have forgotten a whole lot of it. It is for a man in business not only to take up every one of the outs and ins, but to be smart enough to be able to add sufficient to cover every means whereby money goes out. This has been the problem confronting every manufacturing industry in this country, and it always will confront them. I have heard this hundreds of times. It is just as much a study on the part of a business man to tell what it costs to produce his goods as it is to tell what it costs to sell them. The thing that surprises me is that men will do business without an absolute knowledge of what the goods cost and what it costs to place them upon the market. The cost is a study on the part of business men, and I hardly feel willing to admit that you men do your business on any such basis. I say this with great kindness. I have met some competition in the year that I have been in the acetylene business that leads me to believe that some men can produce a first-class generator, fixtures and everything, for about fifteen dollars.

Mr. Davis: As far as our business is concerned, we figure percentage of the cost of material, and we foot that percentage every month. It shows in our monthly reports. We consider it a great benefit, for, if the percentage is right, we know we are going right, and it is a great help to us in our business.

The Chairman: If there is no further discussion on that subject, the association is ready for any new business you want to bring up.

Mr. Wilson: I do not want to take up all of the time, but a question has been raised which was up a good while ago. I do not know whether this would be in order or not, but I move the suspension of the rules and a change in the name of this organization to the "American Acetylene Association," instead of the International Acetylene Association.

Mr. Gannett: I do not believe that could be done without unanimous consent. I think such an important matter should be followed out and a resolution put through.

The Chairman: I think, under the by-laws, that we could not make any such radical change without going through the proper channels, which would be submitting the matter to every member of the association. It is in order to bring the matter up for action, however.

Mr. Higgs: I listened with a great deal of interest to the paper that was read yesterday by our secretary, touching the progress that has been made by the committee in regard to more liberal conditions upon the part of the insurance companies. I knew very well that this question had been up a great many times, and I knew that this association had a great deal of hard work to do to overcome the seeming prejudice that was in the minds of the National Board of Fire Underwriters concerning acetylene as a hazardous illuminant, and I saw by that report yesterday that very much of that prejudice was being overcome. Now, it occurred to me that because of the fact that we had hard work to overcome it, and because of the strenuousness of the Board of Underwriters' rules in examining and permitting generators to go on the market, this condition has been brought about. I believe, from what I know and have been able to gather, that nearly all of the accidents, or a large percentage of those accidents from acetylene have come from generators that have been put upon the market and are in use that are imperfectly made, constructed by men who did not understand the principles of acetylene and how to care for them. It occurred to me that it might be well for this association to appoint a committee to wait upon the National Board of Underwriters, or someone at the head of it, to continue the care they have already manifested in regard to generators to those that may come upon the market in the future. I think we ought to protect ourselves, because we have had a long and hard fight, and it has been a difficult problem, a difficult task, to have those restrictions removed which have handicapped us in our efforts in the past.

Mr. Morrison: I would like to say a few words on this insurance question. I do not know that it is generally understood, but there is, as Mr. Higgs says, a governing body called the National Board of Fire Underwriters, and this National Board is made up very largely of men selected from the various insurance interests both here and abroad, and is a very august body. They issue rules and regulations which are pretty well followed throughout the country. They declare that they will not insure property which contains articles which have not met the requirements they stipulate. This body has under its jurisdiction, so to speak, certain local bodies which take their rules and regulations and carry them out. The rules and regulations which have been affecting the acetylene industry were made some time ago, and it has required a great deal of careful effort to remove the seeming prejudice which existed in insurance circles and to get them to so liberalize their rules that acetylene generators might be put inside. Mr. Higgs' suggestion that a committee be appointed to wait upon the Board of Underwriters to urge upon them our spirit of co-operation, by suggesting that they continue the careful inspection of generators in the future as in the past, is a move toward the better service and better harmony between our industry and the insurance fraternity. On this particular point I wish to say that the whole attitude of this association towards this vexed problem has been one of co-operation with the insurance interests.

Last year your committee reported that progress was being made and that the association and its members had their own fate in their hands if they would abide by the rules and regulations and co-operate with the rules and regulations of the National Board and that co-operation would bear fruit. As a member of that committee I am happy to say that the association has been playing fair with the insurance people. There has been less trouble, better harmony and feeling. The removal of the rules and regulations which permits a greater freedom to the industry does not mean any modification of the rigid charge this Board maintains through the Board of Engineers and its laboratories here in Chicago. We are subject to the same rigid inspection, and we still express to the National body our desire to co-operate by insisting that all generators that are sold should be sold as permitted generators. This gives an opportunity to say a word or two more relative to our relation to the National Board.

We are one of the few industries that has co-operated with reasonable consistency during a period of years. We have been compelled to co-operate because we are a new illuminant. Now these rules and regulations are not the rules and regulations of the Medes and Persians; they have been changed and changed favorably. So long as we deserve it by adherence to these present rules, so long will our industry have the friendship, the co-operation and encouragement of the National Body. It is in the harmonizing of these relations that they have come to recognize that we are rather a prize industry, that we do co-operate, that we do play the game fair, and therefore they have got to show us that it pays to play the game fair. Now, let me say for the National Body that, while it was difficult to get this point understood that whatever might be said of the acetylene generator it is safer than the illuminants it replaces, they have been reasonable and willing to listen to facts, and when they were asked what evidence they had to the contrary, they admitted, "We have none." We brought out three salient points for acetylene. First: Calcium Carbide is not a hazard, whereas the liquid hydro carbons are very hazardous. Second: After generation you have gas practice and fixed units as against the movable units of lamps, candles, etc. Third: The acetylene generator has, for several years, been under the jurisdiction, direction and inspection of the Board of Engineers of the National Board of Fire Underwriters. This has developed an apparatus which is safe.

These points having been firmly established, we maintained before the engineers that we were safer than the illuminants which we replace, and we asked them from their evidence whether we were or not. The answer of the Board was, "You are safer; therefore, we recommend a modification of the rules, so that we can encourage acetylene, and we will do so even to the extent of permitting the generator inside."

That is the situation. We do not need the committee at all, as this work has been accomplished so that our position is well understood in all directions.

Mr. Owen: I think as Mr. Higgs does in regard to this generator business. I do not think there is a generator manufacturer or a member of this association but that is ready to do anything and everything with the insurance people. We are all willing and anxious to make a machine that is absolutely perfect and have the strongest grounds of restrictions possible around it. (Adjournment.)

August 12, 1908. Morning Session.

Meeting called to order at 10:45.

The Chairman: We will open the morning session with a paper by W. H. Merrill of the Underwriters Laboratories of the National Board of Fire Underwriters. Mr. Morrison will read this paper.

Mr. Morrison: Mr. Merrill is manager of the Underwriters' Laboratories, Incorporated, and has charge of the laboratories here. He expresses his regret at not being able to be present at the meeting.

REMARKS OF W. H. MERRILL, MANAGER UNDERWRITERS' LABORATORIES, INCORPORATED, BEFORE THE ANNUAL MEETING OF THE INTERNATIONAL ACETYLENE ASSOCIATON,

AUGUST 12, 1908.

A few years ago, in speaking to you on the subject of Acetylene from the insurance view point, I defined acetylene as one of a number of artificial illuminants which might be the means of causing a loss by fire. I pointed out that the only absolutely safe illuminant thus far seen is the fire-fly, and I deplored the fact that man has not yet been able to copy the excellent example of this insect in the matter of manufacturing light without attendant heat. Every other form of illumination, artificial or natural, so far as I am aware, is open to criticism as having been the means of causing loss by fire. Even the rays of the sun, focused through prismatic effects in window and other glass, have played their share in the destruction of property. Oil lamps, candles, oil gas, coal gas, electricity, acetylene, all have played their parts in furnishing the means whereby they can be turned from the useful servant in furnishing light to the dangerous inmate capable of destroying the structure whose needs they are designed to serve. It only remains, therefore, to classify these illuminating agencies in proportion to their share in the destruction of property by fire, in order that their relative responsibility in the matter of the fire waste may be ascertained. Naturally, this is difficult to accomplish, but insofar as conclusions have been arrived at in our department of the work, I shall be glad to make a report of progress.

Originally we had nothing but theory to go upon in the matter of acetylene, as not so very long ago it was a newly discovered illuminant for practical use, and no field experience was available. To be perfectly frank with you, I must say that all of the insurance men of my acquaintance viewed the acetylene proposition with considerable alarm. It appeared to be such an easy and convenient gas to manufacture,—requiring only that water be added to carbide or carbide to water, its explosive range with air was known to be wide, and the explosive power of these mixtures very great.

Following these first symptoms came another circumstance which caused even greater anxiety. The apparent simplicity of the proposition of manufacturing acetylene gas seemed to raise up an army of inventors, and to bring forward, at least in an experimental stage, machines and apparatus which seemed somewhat crude from the view point of the mechanical engineer. Another very important factor was the ever present attitude of the public in reference to all new illuminants. Americans are the most careless people on earth in respect to safeguarding their property against loss by fire. American cities have about five times as many fires per thousand of inhabitants as European cities, and the annual per capita loss in the United States has been and still is eight times as great as the average per capita loss in Austria, Denmark, France, Germany, Italy and Switzerland. Against a per capita loss of $2.47 in the United States, European countries show amounts ranging from 12 cents to 49 cents. Downright carelessness is probably responsible for at least 50 per cent of the enormous annual waste by fire in this country,—which at the present time amounts to nearly $1,000,000 per business day.

Taking all these things into consideration, you will recognize that theoretically, from the insurance view point, acetylene had to be regarded as a pretty serious proposition. One thing which the insurance people did at the outset, and which I think we all have reason to be grateful for today, was to take hold of the mechanical end of the problem. The legitimate manufacturing companies, as well as the Underwriters, recognize that a lasting success in acetylene required the enforcement of reasonable and necessary safeguards in the construction and installation of acetylene plants. The National Board of Fire Underwriters, by the appointment of its Committee of Consulting Engineers, and the Underwriters' Laboratories by the employment of men like Robinson, Taylor, Glover, Smith and others, demonstrated the ability and fairness of the insurance companies in inaugurating and carrying forward the enforcement of safeguards in acetylene generator construction which would be recognized as essential by manufacturers and users as well as by insurance companies and municipal authorities. The helpful aid of your association came into play from the beginning of your organization, and the dealers in carbide have also been an important factor in promoting this effort for the general good. All of these interests working conscientiously for a common aim, could not fail, it would seem, to benefit the situation.

Turning now from the theoretical to the practical, what has been the experience? Possibly it is a little early to advance anything but qualified opinions in certain directions, but some facts seem to be fairly well demonstrated, and on these we can base both rejoicings and regrets. First we know that the American has been heard from in his use of acetylene as in everything else. The same character of employee, who has for some years lighted a cigarette, filled an open vessel with gasolene, and stubbed his toe when carrying it into a building, has evidenced his thoughtlessness by dismantling a charged acetylene generator by candle light. Against this tendency no fool-proof arrangements in the construction of generator can altogether successfully prevail, and it is this, as much as anything else, which made the rules originally required and now advise that the generator be located in all cases outside of and removed from the building insured. The practical difficulties in outside installations, especially in the Northern States, have necessitated a great many inside installations, and from these we have learned that there is a real practical measure of benefit already accrued to us from the enforcement of the rules on acetylene generator construction. Certain of the troubles which have been experienced have taught us new and better specifications, which have promptly been put into practical application, but the majority of the accidents and fires have demonstrated the unfitness for use of the sub-standard or unlisted machine.

I do not wish to convey the impression that fire losses from acetylene have been numerous. They have not. At the same time it should be borne in mind that statistics which show losses every day in the year from other illuminants and four or five annually from acetylene, must for purposes of accurate comparison, be compiled in reference to the number of installations. As encouraging a factor as any is, perhaps, the experience with carbide. Theory seemed to indicate that this material would come into contact with water through carelessness and accidents more or less frequently, and a large number of fire losses and frequent and violent explosions result. Practice does not seem to bear this out. The combination of the open carbide can and the rain storm, flood or leaky water pipe does not seem to be proving itself to be much of a factor, and the same manner of man who inspects his gasometer bell with a lighted pipe in his mouth seems to be fairly cautious about keeping the top on his carbide can. The manufacturers and the underwriters deserve, I think, some measure of credit for designing and securing the use of proper packages for carbide, and there is no question in anyone's mind, as far as I have heard, as to the benefits secured by the general public through the joint and harmonious effort which has extended over a period of years, and which has resulted in the employment of proper safeguards in nearly all of the acteylene generators on the market today. The measure of benefit to each of the parties in interest cannot be accurately compiled. The fact that a manufacturer and user both went to extra expense to design and install a proper generator, coupled with the fact that the generator has worked satisfactorily for a period of years, does not prove conclusively to either the manufacturer, the owner or the companies insuring the building that a homemade appliance might not have shown the same record, but I think the thought is pretty well instilled in everybody's mind that the chances are something over 90 per cent in favor of the properly safeguarded machine.

I cannot refrain from an expression of appreciation of the part the International Acetylene Association has played in upholding good practices and proper standards for construction. Your prompt and continuous recognition of the fact that the greatest good to your interests was to be found in the direction of the greatest and most lasting benefit to the public, has established a principle of operation which must of necessity make for success. The Insurance Companies, like yourselves, are anxious to place before their customers the best possible goods at the lowest possible price, and to this end they are constantly endeavoring to secure reductions in the fire waste. It is absolutely essential for both the acetylene manufacturer and the insurance company to maintain the standard of quality in their wares, in case they desire continued success. The laboratories, which the National Board of Fire Underwriters has built, and for which it has increased its annual appropriation this year 50 per cent, is but one of many efforts which it is putting forward for the general good, in the thought that whatever makes for a reduction in the enormous annual loss of life and property by fire in the United States, will be helpful in allowing individual Insurance Companies to offer sound indemnity at lower prices, with the natural result of increased volume in business. It seems to me that your effort is along exactly parallel lines,—at least insofar as your relations with the laboratories and underwriters are concerned. You stand for high quality goods to be sold at a reasonable manufacturer's profit and an increased volume of business, as opposed to inferior goods, a few quick and profitable sales and early retirement with a damaged reputation. On this one platform the International Acetylene Association and the underwriters' interests have stood for a number of years, and it is my earnest hope that future years will find us side by side in this creditable endeavor for the general welfare.

The Chairman: We will have a paper by Mr. Ostby on "The Present and Future of Dissolved Acetylene."

THE PRESENT AND FUTURE OF DISSOLVED ACETYLENE.

By Oscar F. Ostby.

First, let us consider the railway field. Acetylene has, without the question of a doubt, been a big factor in creating a demand for better lighted cars, and, since its introduction, the mantle has been brought out in connection with the oil gas system. This mantle makes a great improvement in the light and, while the mantles are new, the light compares favorably with acetylene, but our railroad cars are not the place for mantles for reasons too numerous to mention, and the additional cost of maintenance of such lamps, necessitated by the breakage of mantles, etc., hardly warrants the change when the numerous advantages of the Safety Storage System are considered. While it is claimed that the mantle greatly increases the burning hours, the fact still remains that for branch line service (unless charging plants are convenient), it does not fill the bill; and for anything but short runs, it is customary to use up to six tanks under the car. With the Safety Storage System, one tank supplies a car with light for from four to eight weeks. Such storage capacity eliminates the dangers resulting from the charging of tanks under the cars while in the passenger stations with the inspectors going about with their torches. Furthermore, if a car for any reason is delayed so that it can not get to a charging plant, with our System the car need not go dark.

Another feature which is of great importance when considering car lighting, especially in the warmer sections of the country, is the heat produced by the illuminant used, and the oil lamp of former days, relics of which we still have with us, is not only a big factor in making the cars uncomfortably warm this time of year when we have too much heat anyway, but further adds to the discomfort of the weary traveller by the ever present smell of oil. The open flame oil gas lamp, while it does away with this last mentioned feature of the oil lamp, makes a pretty good heater, and with the adoption of mantles, the value of the lamp as a heater is greatly increased, but it is light we are after and there is no illuminant which gives less heat than acetylene, excepting, of course, electricity.

The question which we are most frequently asked is relative to the safety of acetylene; in fact, in a good many cases we are told that our system is dangerous, and yet, not a single instance is recorded where our Safety Storage System, under service conditions, has been the cause of the loss of a single life or a cent's worth of property. All the tests made have more firmly established our claim for absolute safety.

There is only one safe method of handling compressed acetylene, and that is by solution in acetone in properly packed tanks.

By properly packed tanks, I mean tanks filled with porous material of 80 per cent porosity and treated in such a way that it will not sag and develop large free spaces. I believe the Canadian Railway Commission has done more than anybody for acetylene in Canada, by prohibiting the use, on railways, of acetylene systems known to be dangerous, and I think the movement, started by our President and Secretary, protesting against the charging of tanks by those unfamiliar with the system, should receive the hearty support and coöperation of the association. Acetylene is no more and no less dangerous than any other gas. Like everything else it must be handled right. The most dangerous thing in the world is fire, but we all have it in the stove at home and are not afraid of it unless a child or someone that don't know any better moves it from the stove to the floor—then it is apt to burn down the house.

Considering the advantages of acetylene for car lighting, there is no reason why it should not have a bright future in every sense of the word.

HEADLIGHTS.

For locomotive headlights, acetylene is second to none. It is true that with an acetylene headlight it is impossible to get the projection of an electric, but it gives all the light required and that is all that's necessary. A train is not run by a headlight, but by signals. An engineer who comes in the opposite direction and has to face a locomotive equipped with an electric headlight is temporarily blinded by its powerful rays thus making it difficult to make his signal. Acetylene is not of such a blinding character, but has the penetrating power so necessary for this kind of work. Look at it from the stand-point of economy and there is nothing else like it. A small tank is placed in any convenient place on the locomotive and runs the headlight for a month.

There has been a good deal of agitation on the locomotive headlight question, and in some of the states laws have been passed prohibiting the use of anything but the expensive electric headlight; where such laws have been passed it must have been owing to ignorance on the part of those who made them. I am glad to say that there are localities where such laws have been proposed but have been defeated. From the praise of acetylene headlights by locomotive engineers, and they ought to know, I think the acetylene headlight will illuminate the track for some time to come.

SIGNAL LIGHTING.

For years attempts have been made to produce a satisfactory long time oil burner for signals and there has been some advancement made, but such lamps require a lot of attention and furthermore, are not as reliable as they might be. Lighthouse boards all over the world agree that acetylene is by far the best marine signal light owing to its great penetrating power, and if it is the best for marine signals, there is no reason why the same should not hold good for railroad signals, provided, of course, that the cost of maintenance is not too high.

There is another very important reason why acetylene makes an ideal railroad signal, and that is because under its rays all colors hold their true and natural values, which cannot be said of other artificial illuminants.

Furthermore, acetylene burns without smoke and does not in that way change the shade of the light. When all these advantages are taken into consideration, it will at once be seen that it is possible to use a wider range of colors for signal lights.

The method of installation is very simple. A tank is placed in any convenient place, and the gas is piped to the lamp or lamps, whatever the case may be. The lamps are equipped with 1/8' burners, and a 12"x36" tank will supply a lamp about 75 days, when the empty tank can be exchanged for one fully charged. Any number of lights can be run from one tank and the burning period is dependent entirely upon the size of the storage cylinder used.

Any storm proof oil lamp can be converted to use acetylene at a very small expense, and I have been told by locomotive engineers that they can see the acetylene signal a great deal farther than the oil.

Signal lighting, while it is yet comparatively a new field, has great possibilities, and looks to me as though it would solve the railway signal problem as far as the long time burner and the light goes.

MARINE LIGHTING.

As I have already stated, lighthouse boards all over the world agree that acetylene is the ideal marine signal light, and acetylene lights can be found wherever boats travel. The first essential in a signal is reliability; cost of maintenance is a secondary consideration. However, the cost of maintenance must not be so high as to make it prohibitive. The first signal lights established on our seas burned continuously without flashing, but authorities agree that the most satisfactory signal is one which flashes, and in this connection, a new flasher which I believe is going to greatly increase the use of acetylene in this country for lighthouses, beacons, and buoys, will interest you. As Captain Ross of the United States Lighthouse Board showed last year, the ideal signal light is one that will run for a long period of time without attention and with this new device used in connection with the dissolved acetylene system, we have the ideal. This flasher, known as the "Aga," was invented over four years ago by Mr. Delen of the Gas Accumulator Co. of Stockholm, Sweden.

The Aga flasher has been adopted extensively in Sweden and also by some of the other European countries, and during the four years in which these apparatus have been in service there has not been the slightest trouble and lighthouse engineers who have had these lights under their supervision have nothing but praise for the operation of the lights.

The acetylene generating buoys now in service use two 1/8' pilot burners. With this device we use a by-pass burner consuming only 1-75 cu. ft. of gas per hour. Of course to use such a small quantity of gas, the gas must be absolutely pure. The saving accomplished by the use of this small by-pass burner means nearly 2,000 cu. ft. of gas per year over the generator buoys.

The great objection to the generating buoy is that if it is to run a light for a year it is so large that it makes it difficult to handle. With our system in connection with the Aga flasher, a tank which can easily be handled will run the light for a year without any attention, and because of the purity of the gas there is no chance of the burners carbonizing. The changing of tanks once a year is a very simple matter, as the buoys are taken up annually to be scraped and painted.

A buoy equipped with a 375 M. M. lenz and a 3/4' burner will show a light for from ten to fourteen miles depending upon the weather conditions; the cost for gas at the present price of $15.00 per thousand to the government would amount to less than 535,00, andq this is economical lighting. The system is not only used for buoys but for lighthouses and beacons, and light-ships. In a lighthouse where a very high C. P. is necessary, the time which the light will burn depends entirely upon the size and number of tanks installed. A stake light, where but little light is needed, with one small tank in connection with the Aga flasher will last a whole season.

In connection with their flashing device, the Gas Accumulator Co. are using another very interesting and ingenious device which they call a Sun-valve. This Sun-valve automatically shuts the gas off in the morning and when night comes the valve is again opened allowing the gas to pass through and burn. This does not depend upon clock work but simply on the expansion and contraction caused by the sun's rays. We do not particularly recommend this device for buoys, which are always knocking about, but it is being used in Europe with great satisfaction for lighthouses and beacons, and shows a further saving of from 30 to 40 per cent in gas consumption.

If there is no chance for the light to go out, the keeper is not necessary unless it is to turn on and shut off the gas, and here we have a perfect device which will take the place of the keeper, and further cut down the already low cost of maintenance. This ingenious device has been in continuous service for long periods and has never given any trouble.

The future of dissolved acetylene is bright indeed and the development of new uses is constant.

The Chairman: We will now hear Mr. Bullard's paper.

(Demonstration of flash light for signal lighting by Mr. Ostby and Mr. Nordvall.)

Mr. Nordvall: In our country we have about twelve to fifteen hundred small beacons. These lights have cost the government for attendance between $200 and $300 a year. Besides this it draws, in common oil, about $25 a year. I will say on an average the cost of maintenance of these small beacons is from $325 to $350 a year. Then we got only about ten candles in the flame itself. I offered the government a light which can burn without attendance for one year, giving about forty-five candles in the flame itself, and needs no attendance at all. This is a saving of over $300 for every beacon, and with twelve to fifteen hundred beacons $300 a year is not a small amount to a poor country like Sweden. So the Swedish government has decided to change all their oil beacons and put in acetylene instead. In Norway, Denmark, Finland, Russia, Ireland, Italy, Spain and Germany our system has been accepted, after long trials and tests, of course. There is no authority so conservative in the work as the Lighthouse Board. Of course they ought to be, because they have so many lights. They cannot put up lighthouses which will one night go out, for several hundred thousand dollars might be lost. I hope that with what Mr. Ostby has told you that you will have some idea about our system.

NEW ACETYLENE FLASHING SYSTEM FOR LIGHTHOUSES, BEACONS AND BUOYS.

To supply lighthouses with an ideal illuminant for periods up to one year and beyond without attendance and at a reduced cost, that is the proposition which is destined to make our gas as familiar along the world's coastlines as the same light has become well known in its fittings everywhere at the head of motors on land. The new system which admits of such possibilities hails from Sweden. A live exhibit of one of the Swedish lighthouse flashers before the International Convention, was a chief and surprising attraction during the Chicago meeting.

This system has advanced beyond the stage of mere novelty. In Sweden where it originated over one thousand government beacons and lighthouses have used the system some for about one year after thoroughly testing. The invention is that of Mr. Gustav Dalen, chief engineer of the Gas Accumulator Co., of Stockholm, Sweden, which company makes a specialty of acetylene marine lighting by the system here mentioned. The system is one which depends upon acetylene dissolved in acetone—known in Sweden as acetongas—which product is already well known in this country. Mr. A. R. Nordvall, general manager of the Accumulator Co., Ltd., of Stockholm, was present at the convention, and at our request has prepared the following notes which refer to the use of the present system.

"It was a number of years after acetylene dissolved in actone—or 'acetongas,' as it is called in Sweden—was put on the market before the same could be satisfactorily utilized in lighthouse service throughout the world for the following reasons:

"First—The difficulties involved in properly characterizing the light so as to fit the requirements of navigation; and second, the comparatively high cost of producing and supplying the gas.

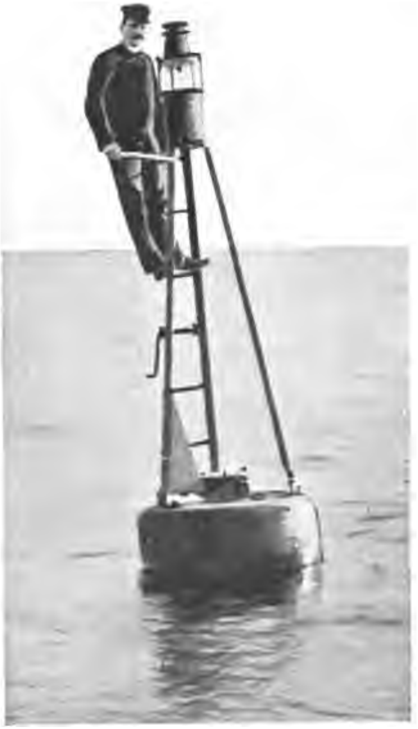

Fig. 1. New Acetylene Flashing System, Which Interested the Convention.

"These difficulties have been very thoroughly eliminated by the inventions of Mr. Gustav Dalen, chief engineer of the Gas Accumulator Co., Ltd., of Stockholm, Sweden, by means of whose flashing apparatus, sun valve and other devices exploited by the above named company, acetylene lights can be characterized so as to give navigators the very best signals, and at the same time the cost of operation has been brought down to a minimum.

"The inventions of Mr. Dalen have made it possible for acetylene to enter into successful competition with other systems of marine lighting, although it took the Swedish company a long time and cost much labor to work out an entirely new marine signal system, based on the use of dissolved acetylene, and having in view the advantages of being able to leave lighthouses and buoys without attendance for periods up to a year and more, and at the same time work with absolute precision and reliability.

"This has finally been accomplished and tests have been made by the government officials in most countries to whom it has been conclusively proven:

"First—That the Dalen flashing system of acetylene buoys and beacons operate with absolute reliability without attendance for periods up to a year and more.

"Second—That the first cost in installations for lighthouses, or the purchase of buoys, even when fitted with gas tanks sufficient for one year's constant service, is by no means higher than that of systems hitherto used, but is in fact considerably cheaper when the great storage capacity, reliability, and high illuminating efficiency is taken into consideration.

"Third—The cost for maintenance has been brought down to a minimum. The flash light apparatus not only gives a better navigation signal than the constant burning flame, but also actually saves acetylene, for the sufficient reason that no gas is consumed during the dark intervals of the flash light period.

"When short flashes can be used, for instance, a flash of 0.3 second duration every third second, 90 per cent of the gas is saved, as compared with continuous burning. Of course the longer the light periods the less is the saving until a flash period of one-half light and one-half dark is reached, and even then a saving of 50 per cent is obtained.

"Even when a considerable quantity of the gas is saved by means of the flashing apparatus, it is still a great waste of money for the lights to be kept burning during the day when they are not needed. This system therefore was founded on the principle "no lighthouse keepers, no attendance," and it was up to Mr. Dalen to invent an apparatus which would do the work of a lighthouse keeper, viz.: The remarkable act of extinguishing the lights at dawn and relighting them in the evening.

"In this he was highly successful and the 'sun valve,' the perfect automatic lighthouse keeper, was evolved.

"It is a device that works with never-failing regularity. Better yet, as will be seen, it makes a definite additional saving of from 30 to 40 per cent generally, while in tropical countries the percentage of saving by the use of the sun valve would be even greater.

"Another means of gas saving by this system is a pilot flame of special design which permits of a continuous flame consuming but 10 liters (approximately 4-10 cu. ft.) every twenty-four hours, which is in striking contrast to the pilot flames or burners used in connection with generating systems and consuming no less than 3 cu. ft. of gas per twenty-four hours, and generally requiring two such burners per lamp. Furthermore, this pilot flame does not carbonize.

"As an instance of what the saving in the single item of wages amounts to the following note may be of interest:

"There are in Sweden about 1,200 beacons and leading lights, and the government lighthouse board paid from $100 to $300 per year each for their keepers. These beacons were fitted with oil lamps giving about 10 c. p. inside the lens, and requiring refilling about once a week.

"Since the adoption of the new system by the Swedish lighthouse board, after years of thorough testing, these beacons have been equipped with flashlights giving 45 c. p. inside the lens and with tanks enough to last a full season of from eight to ten months.

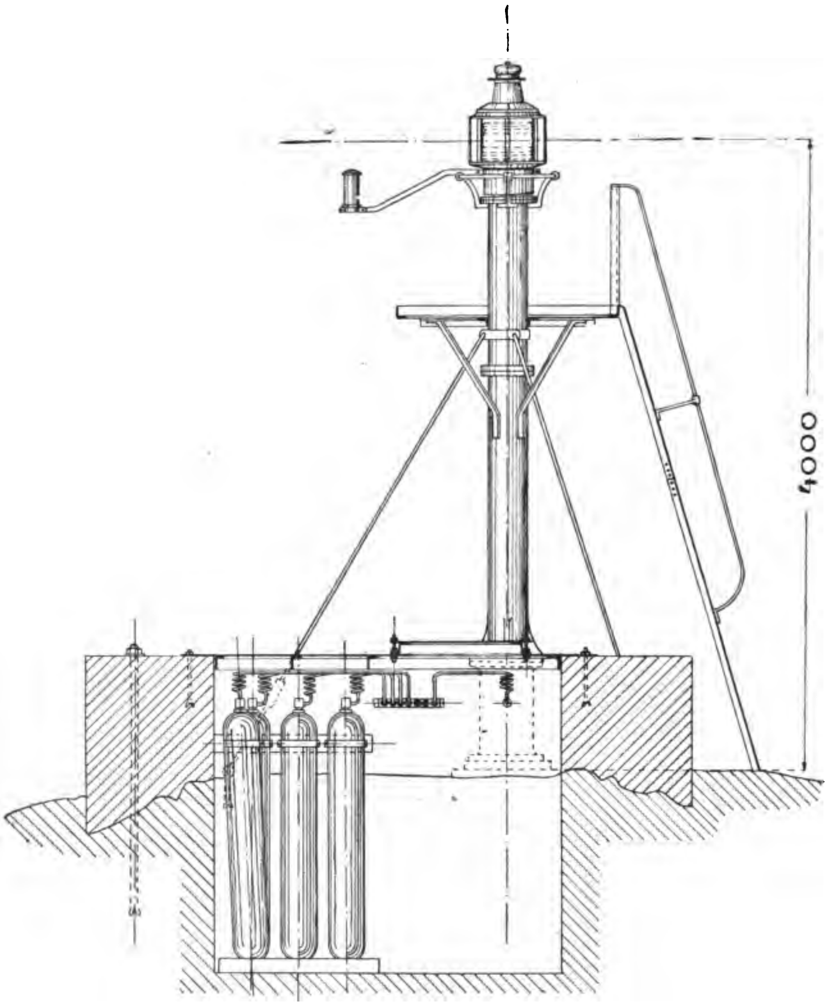

Fig. 2. Cross Section of the New Acetylene Flashing System, Showing Marine Beacon of Four Tanks. The Sun Valve is on Arm to Left of Lantern.

"The cost of the gas amounts to the same as the cost of the oil, but the wages of keepers are saved and a light four or five times better is secured."

The illustrations of this system here presented are based upon its use in Sweden.

The first engraving, Fig. 1, is that of a small light buoy such as is chiefly used in harbors. It is provided with a 200 mm. lantern fitted with a one-half foot burner giving in the lens about 150 c. p. and a flashing apparatus giving a short flasn every third second. The gas tank used with the buoy is of type A-50 (length 1,700 mm., diameter 230 mm., and weighs complete with gas about 100 kgr., equal to about 200 lbs.), which holds from 5,000 to 6,000 liters (about 200 cu. ft.) of acetylene, and will run the buoy approximately four months. The tank is placed inside of the floating chamber of the buoy and can easily be changed without taking the buoy .out of the water. This buoy weighs complete approximately one ton, has a draft of four meters, and a focal plane of 3.1 meters.

It is used extensively in Europe; in the port of Amsterdam there are twelve and in the Danish waters, for the ferry passages, fifteen of these buoys. The Swedish port Gefle uses eight of these buoys from the Baltic into the harbor.

Fig. 2 is a cross section of this style of beacon such as has been extensively adopted by the Finnish lighthouse board. It will be seen that the beacon is equipped with four upright tanks containing about one thousand cubic feet of compressed acetylene. It is provided with a lantern with 300 mm. lens and a burner giving through the lens about 400 c. p., flasher giving two short flashes every eight seconds (0.4 second light and 1.2 seconds dark and 0.4 second light and 6 seconds dark) and sun valve.

The cost of gas for this beacon is about $15 a year.

In the cross section, Fig. 2, there is shown to the left of the lantern a projecting arm supporting what is known as the sun valve, above mentioned, a patented device for lowering and raising the acetylene jet. Here we will introduce a cross section of the lantern proper, Fig. 3, and a perspective of the sun valve, Fig. 4.

The cross section of lantern (Fig. 3) shows complete storm-proof lantern manufactured to carry from 200 mm. to 500 mm. lenses. The new feature of this lantern is that the bars are made vertical and light reflecting by means of prisms attached on the inside of the bars; this eliminates shadow and makes it possible to spread the light uniformly in all directions. All other lanterns use diagonal bars which cut off about 30 per cent of the light.

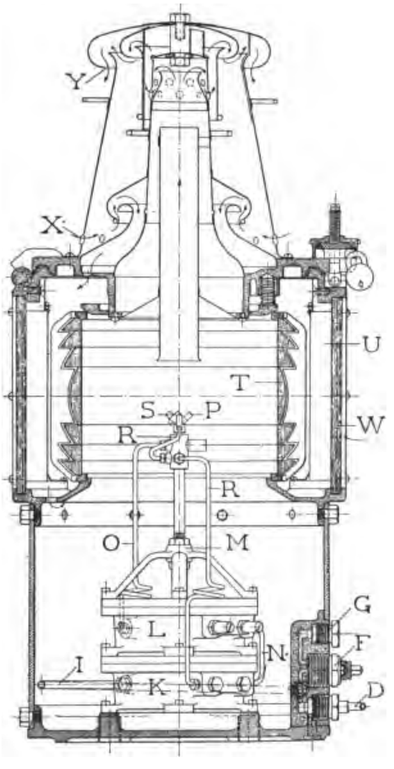

Fig. 3. Cross Section of Storm-proof Acetylene Lighthouse Lantern for the Flasher System.

This lantern can be used for either beacon or buoys and is explained as follows: K.—Pressure regulator which reduces the tank pressure to the pressure necessary to operate the flasher. L.—Flashing apparatus by means of which any character of occulting light can be obtained. This apparatus can divide one liter of acetylene into 2,000 flashes. It operates automatically. M.—Adjustable burner stand. P. Burner. S.—By-pass or pilot flame. This by-pass consumes only 0.36 cu. ft. of acetylene per day.

I.—Is the tubing from the lantern valve D. F. G., which connects the tank to the light apparatus. N.—Tubing from pressure regulator to flasher. O.—Tubing conducting the gas from flasher to burner. R.—Tubing from pressure regulator to pilot flame. T.—Lens. U.—Vertical bars. W.—Glass enclosing lantern. X.—Air inlet to lantern. Y.—Air outlet.

It was the flashing of acetylene by this lantern and the use of a tank supplied by the Commercial Acetylene Company, 80 Broadway, New York, which company is coöperating with the Swedish concern, that riveted the attention of all convention visitors, as in the exhibition the flashes were changed in many ways during the fifteen minutes that the lamp was in operation.

The sun valve (Fig. 4), already mentioned in connection with Fig. 3, is a device of remarkable power and adaptability. By means of this simple apparatus the radiating natural sunlight is used to shut the gas passage, which is kept open when the apparatus is not exposed to light.

The apparatus is founded on the well-known principle that a body with a surface that absorbs light will have a higher temperature and thus expand more than a similar body with a surface that reflects the light, when both are exposed to the same light. This difference in expansion operates on a valve which opens or shuts the gas passage to the burner.

This apparatus is very strong and simple and absolutely reliable. Numerous installations on lighthouses and beacons in Europe have proven that by the use of this sun valve a saving of from 30 to 40 per cent of gas has been made. It is patented the world over.

The harbor buoy shown in Fig. 1 is produced in a number of variations. One of these is known as Type B.300, and which is provided with a tank containing 1,200 cu. ft. of acetylene and with a 1-foot burner giving in the 200 mm. lens about 250 c. p. The lantern is equipped with a flasher adjusted to give 0.3 second light and 2.7 seconds dark. With this flash the tank will supply the buoy with gas for one year without attention.

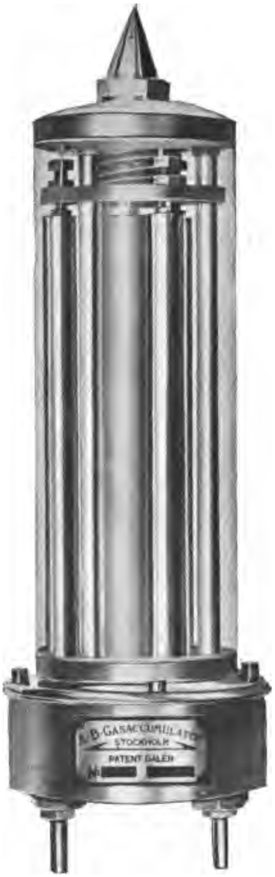

Fig. 4. The Wonderful Sun Valve, Which, With the Acetylene Flashing System, Takes the Place of Lighthouse Keeper.

The complete buoy weighs about two and one-fourth tons. The tank is charged when the buoy is taken in once a year for overhauling and painting. A great number of these buoys have been delivered to Sweden, Russia, Finland, Italy, Argentina, Chile and Japan.

Another style is known as the shallow water buoy which appears in Fig. 5.

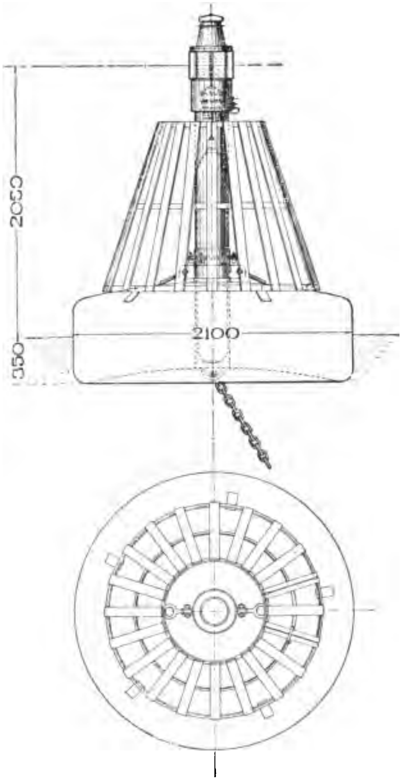

Fig. 5. Shallow-Water Buoy and the Acetylene Flashing System.

This buoy is fitted with the same lantern, flasher, burner, etc., as the buoy B.50-1, shown in cut No. 4, but is constructed specially for shallow waters with high tides and for rivers where floods are frequent. It is not provided with the tail and the counter weights, which makes the buoy B-50/1 draw four meters of water, but is instead made large in diameter, which makes it a steady, serviceable buoy. The buoy is 2,100 mm. in diameter, is 300 mm. deep, and has a focal plane of 2,050 mm. and weighs about 850 kgr.

Besides the buoys above mentioned the Swedish company makes all sies suitable for all conditions. It has recently offered to the United States government a number of combined light and whistle buoys provided with 375 mm. lanterns and a focal height of about 20 feet. Each of these buoys will give about 500 candles which can be seen about 15 nautical miles, and will operate without attendance for about 15 months with the following character of light: one-half second flash every third second.

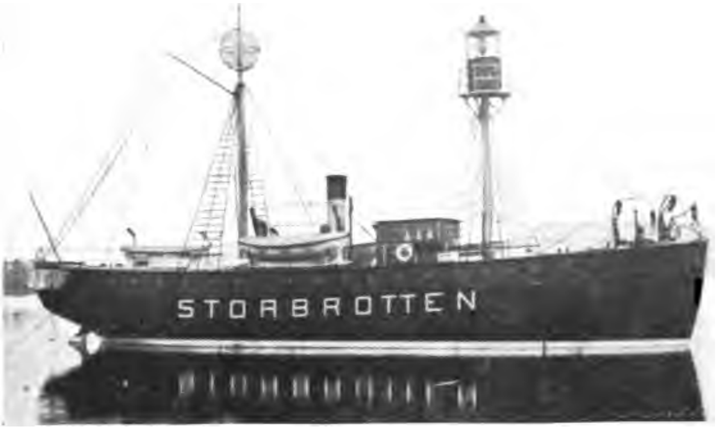

Fig. 6. The New Acetylene Flashing System Adapted to Swedish Lightship.

The system here referred to is perfectly suited to lightships and one of these in Swedish waters is shown in Fig. 6. This ship has a sufficient number of gas tanks (each weighing about 200 pounds) to run the light a whole season. The lantern is hung and balanced on ball bearings. No matter how the ship may roll and pitch in the sea the lens and burner will always hang in the vertical plane and spread the light uniformly all around the horizon.

This lightship has a light power of about two thousand candles and gives the following light character:

½ sec. light + 1 sec. dark +
½ sec. light + 1 sec. dark +
½ sec. light + 10 sec. dark.
total period 13.5 seconds, flashlight time 1/9 of whole.

Of this type six are used in Sweden, and it is also meeting with marked success in Finland.

STATUS OF THE ACETYLENE INDUSTRY ON THE PACIFIC COAST.

By E. D. Bullard.

The great earthquake and fire of two years ago destroyed all records of the acetylene business in San Francisco. The early history of the industry must, therefore, partake of the nature of personal experience.

Before I came to the coast in 1894, I was largely interested in an electric light plant in New Mexico. Knowing this, a friend returning from the East showed me the first calcium carbide I had ever seen. He advised me to get rid of my electric plant, as he said this gray substance could be manufactured so cheaply that it would surely take the place of all other artificial illuminants in the near future. Naturally I was deeply interested, and as soon as the Naphey Generator was placed on the market I secured the agency. An exhibition plant was not allowed by the city authorities in San Francisco; consequently I leased a place in Oakland and went over every day from November until March without making a single sale. That was the first real missionary work ever done on the Pacific Coast for acetylene. My first sale was made the following Spring and then my troubles began. The "Naphey" could do more unexpected and queer things than any machine manufactured since. My first customer was of a scientific and progressive mind, and between us we managed to have a light part of the time. The crisis came one evening when he had a dinner party and a carbon "rooster" dropped red hot from one of the burners upon his wife. After this the generator was consigned to the scrap heap. He retains the name-plate and exhibits it to show what he suffered in the cause of scientific research.

Soon after this the water-feed generator made its appearance, and then the missionary work began to bring results. Local firms found they could produce this wonderful light, and undeterred by threats of patent litigation, began the manufacture of gas machines which fed the water upon the carbide. Most of these machines were very poorly made and expensive to operate; the burners would clog up frequently. Enthusiasm was dampened, but the business was carried on with partial success until 1901 when the first carbide-feed machines came out. We then had our work to do all over again. Little by little, the carbide-feed method gained, until today there is only one of the water-feed type of machines made on the coast. We unfortunately had no standard ruling by the insurance companies as regards acetylene machines; consequently, the business on the coast suffered from the energy of plumbers and tinsmiths who turned their attention to inventing carbide-feed acetylene generators. This crop of gas machines was a large one. The material, however, was usually poor and the workmanship so crude that, after a couple of years of acetylene debauch, most of the local machines went the way of all flesh.

It is gratifying to note that the public, after many a sad experience, has gained considerable knowledge regarding the matter, and people generally now look into the merits of the machine.

"A primrose by a river's brim,
A yellow primrose was to him
And it was nothing more"

no longer applies on the coast. People realize that acetylene can be delivered without burner troubles and that machines are constructed that will do good work continuously. Therefore, at the present time it is not hard work to sell a first-class machine. People will no longer buy a machine simply because it is cheap. Some inferior machines are still manufactured upon the coast, but there are a few carbide-feed machines made on the coast which are very satisfactory and which really meet requirements.

Electric power is very well developed on the Pacific Coast and both power and light are sold at very reasonable prices. This acts as serious competition to acetylene, but not by any means prohibitive. The field for acetylene is very large; the acetylene business is growing; the introduction of cooking and heating appliances has helped very much, as acetylene appeals very strongly to residents in a large part of the coast where the summer is intensely hot, and consequently this gas is greatly welcomed for a cooking medium as well as for a practically heatless light.

We have a good many town lighting plants in operation on the coast. Some of the finest resorts are using Acetylene, and many schools and universities are finding Acetylene exceedingly satisfactory. One notable installation is at the Pfister Knitting Company, Oakland, California. This I reserve for special mention because the light is found of great advantage during the autumn and winter to bring out the true colors.

The recognition of acetylene industrially, where judgment regarding colors must be accurate, means, I believe, the opening of a new field. The attention of the Acetylene Association is specially called to this.

At Mills Seminary they have electric lights on the grounds, but have selected acetylene as the best light for the students. Mills Seminary also has a cooking school department in which Acetylene is used entirely, and is used also in their laboratory.

In viewing the present condition of acetylene on the Pacific Coast in the light of the past, there seems nothing but a most hopeful future ahead of it. It is becoming gradually so well known that scarcely a town or hamlet is without an acetylene plant of some kind. The public has at last become convinced that acetylene is one of the safest of illuminants, inside or outside, but as a matter of fact, as we have no freezing weather, most of the installations are outside installations. These facts, together with the beauty of the light itself, are bringing acetylene forward as a successful competitor of all other means of illumination.

The Chairman: We are now ready for the report of the Auditing Committee.

Mr. Carroll: Mr. President, the Auditing Committee has examined the books for the period since the last meeting and finds them to be correct as shown:

Balance on hand September, 1907	$ 28.67
Total receipts for year	1,097.00
Making total cash	$1,125.67
Total disbursements for the same period are	$515.70
Balance on hand	609.97

We have also checked up the invoices, vouchers, etc., and found them correct.

The Chairman: Gentlemen, you have heard the report of the Auditing Committee. What is your pleasure?

Mr. Stinson: I move that the report be accepted as read.

(Motion seconded.)

The Chairman: It is regularly moved and seconded that the report be accepted as read. All in favor signify by saying, Aye. Contrary, No.

(Motion carried.)

The Chairman: Now, gentlemen, that winds up our regular program of papers, and motion to adjourn is in order. We will be able to devote the entire afternoon session to the election of officers. As I believe the automobile ride is planned for 5 o'clock, we can probably defer the afternoon session until about 3 o'clock. Motion to adjourn is in order.

(Motion carried for adjournment until 3 o'clock.)

Adjournment.

August 12. Afternoon Session.

Meeting called to order at 3:30.

The Chairman: I believe that the business before the association this afternoon is the election of officers. I would like to appoint as the Ballot Committee, Mr. Carroll, Mr. Collins.

Mr. Kirchberger: For the purpose of a motion, I suggest that the President give up the chair to the Secretary.

The Chairman: I think that Mr. Gannett is chairman of the Board of Directors. I will ask Mr. Gannett to take the chair, if I am asked to surrender.

Mr. Gannett: Our present presiding officer has only been actual President for forty-eight hours. He has for a whole year had all the offices and labor of his office without having the pride of his office. For forty-eight hours he has given us a good example of what we are likely to get as actual President, and I hope to voice the sentiment of the association if I say we want more. I move the suspension of the rules and that Mr. Carney be made President of this association.

Mr. Long: I second that motion.

Mr. Gannett: It has been moved and seconded that the rules be suspended and that Mr. Carney be unanimously elected President for the ensuing year. All in favor signify by saying, Aye. (Motion Carried.) Mr. Carney is duly elected President for the ensuing year.

Mr. Carney: Gentlemen, it is needless for me to say that I am overwhelmed with the honor conferred upon me, and I shall try to deserve during the coming year all the good things that Mr. Kirchberger has said about me. I think I can assure you that I will labor earnestly at the head of your organization as I have in the past for its welfare. I thank you heartily for the honor conferred upon me.

Mr. Ostby: Mr. President, I think that we have another ex-officer that has done a great deal of good and has shown us that he is the right man in the right place, and I think should be unanimously elected for the coming year, if not for life, and that is our Secretary, Mr. Morrison.

Mr. Kruesi: I, therefore, make that motion that we suspend the rules and that the Secretary be instructed to cast a ballot for himself.

(Motion seconded.)

The Chairman: It has been moved and seconded that the Secretary be instructed to cast a ballot for himself as Secretary of this association. Are you ready for questions?

Mr. Menczer: Is this supposed to be for life?

Mr. Kirchberger: I think that the Secretary would prefer to have this vote taken by acclamation.

The Chairman: It has been moved and seconded that Mr. Morrison be nominated as Secretary for this association by acclamation. Ready for questions?

(Motion duly seconded and carried.)

Mr. Morrison: Gentlemen of the convention, it is a very genuine pleasure to me to feel that you regard my efforts during the year on behalf of the association in so favorable a light. With Mr. Carney I can say that I hope the future will bring lots of good hard work which I shall do gladly for the association. I have had co-operation in all directions and I know that you all have a good, friendly feeling for your Secretary. I feel it; it comes to me from all directions. With that as a stimulus, I know I can go forward and I hope to do the best possible work for the association during the coming year.

The Chairman: The next officer to be elected is the Vice-president.

Mr. Menczer: I would like to suggest Mr. Oscar F. Ostby.

Mr. Davis: I did not object before because it was unanimous, but I believe we must nominate by ballot according to the by-laws.

The Chairman: You are correct; I acknowledge the error. Will ballots please be distributed by the committee?

Mr. Davis: There is possibly another thing that the members may not be familiar with. That is, who is entitled to vote. I think that should be understood.

The Chairman: For the benefit of those who may not be thoroughly familiar with the by-laws, I will say that only the regular members of the association are entitled to vote, and I believe only three votes from any one company. The associate members are not entitled to vote for the election of officers or any other business.

Mr. Carroll: We will announce the vote for Vice-president. There were twenty-eight votes cast. Mr. Ostby 21, Mr. Webb 2, Mr. King 1, Mr. Collins 1, Mr. Wilson 1, Mr. Kruesi 1 and Mr. Kirchberger 1.

Mr. Gannett: I think that the by-laws state that the first is an informal ballot and the three highest are nominated. I move the suspension of the rules and that Mr. Ostby be unanimously elected Vice-president.

Mr. Kruesi: I second that motion.

The Chairman: It gives me pleasure to put this motion that the rules be suspended and Mr. Ostby be unanimously elected Vice-president. Ready for questions. All in favor of the motion as put signify by saying, Aye. Contrary, No. (Motion carried.)

Mr. Ostby: I beg to express my great appreciation of being made Vice-president of this association. Thank you.

The Chairman: Now we have two directors to elect to replace Mr. Ostby and Mr. Menczer, whose terms have expired.

Mr. Gannett: When the by-laws were changed last year, two directors were elected for one year. Mr. Ostby's term expires now and Mr. Menczer's, so two directors should be elected now for three years.

Mr. Webb: Could you read the names of the present directors for the information of those who do not know?

Mr. Morrison: The directors are Mr. Gannett, Mr. Kruesi, Mr. Bigelow, Mr. Carroll, Mr. Menczer and Mr. Ostby. The retiring members are Mr. Menczer and Mr. Ostby.

Mr. Wilson: In view of the fact that we have not a whole lot of representatives in the Southwest, I would like to move the suspension of the rules and that Mr. Menczer be elected for three years more,—just to make it certain that he is going to be elected.

Mr. Kruesi: I second the motion.

The Chairman: It is regularly moved and seconded that the rules be suspended and Mr. Menczer he re-elected for three years, this by acclamation, as director of this association. All in favor signify by saying, Aye. Contrary, No. (Motion is carried.)

Mr. Menczer: I thought that the directors ought to be more selected from the Northern and Eastern cities.

The Chairman: You were requested for a speech, not a protest.

The Chairman: We will proceed to ballot for the other director.

Mr. Kruesi: I move the suspension of the rules and Mr. J. M. Brock be elected by acclamation for the other director.

(Motion seconded.)

The Chairman: It is regularly moved and seconded that the rules be suspended and Mr. J. M. Brock be elected director of this association by acclamation. All in favor of the motion signify by saying, Aye. Contrary, No. (Motion carried.)

I beg to announce that Mr. Brock is now a director of this association.

Gentlemen, we are about to close the regular sessions of the eleventh annual meeting of this association, and a little later we hope to have a ride in touring cars through the park to the South Shore Country Club. I do not know whether we will be able to make the trip or not. If it is clear by 5 o'clock, the cars will be here, and unless it is raining, or looks as though it would rain while on the trip, we will have the cars here ready. If not, we will be obliged to eliminate that part of the entertainment.

I will let Mr. Morrison make the announcement for the dinner this evening, but before I sit down I want to thank you heartily for the attention you have given to the various sessions you attended, and I hope that you will all go to your homes feeling that you have profited by this meeting.

Mr. Morrison: I will announce for the benefit of the ladies that the program tonight for the ladies is that they shall meet at the Chicago Athletic Association at 7 o'clock. They will have dinner there by themselves and will then take carriages for the theater, where seats have already been reserved, and it will be arranged so that the carriages will come back and call for them, taking them to the Palmer House, where some go, or to the Auditorium. That constitutes the ladies' program.

As regards the banquet, it will take place promptly at 7:30 at the Chicago Athletic Association. It will be well to get there some time before. You will enjoy the privileges of the Club, of course, until the banquet is called. There is a comfortable room on the third floor where we will all meet and go in a body to the banquet room, where provision has been made for all. That constitutes the final event on the program as far as the association is concerned.

Mr. Gannett: I move that the association extend a vote of thanks to the ladies' reception committee, who have been so earnest in their efforts.

(Motion seconded.)

The Chairman: It is regularly moved and seconded that the ladies' committee be extended a vote of thanks for the manner in which they performed their duties and helped make this meeting a success. I am pleased to put